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C.

VACCINATION:

Commonwealth of Massachusetts
HEALTH ... SANITARY.

ITS NECESSITY, CONTROL, EFFICIENCY, AND SAFETY.

PREPARED BY

EUGENE FOSTER, M.D.,

Augusta, Ga.,

CHAIRMAN OF THE COMMITTEE OF THE AMERICAN PUBLIC HEALTH ASSOCIATION ON COMPULSORY VACCINATION.

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REPORT OF THE COMMITTEE ON COMPULSORY VACCINATION; ALSO, A SUPPLEMENTARY REPORT ON THE EFFICIENCY AND SAFETY OF VACCINATION.

PREPARED BY EUGENE FOSTER, M.D.,

Augusta, Ga.,

CHAIRMAN OF THE COMMITTEE.

Your Committee on Compulsory Vaccination, charged with the duty of inquiring into the expediency and practicability of causing every citizen of the United States to be vaccinated, and that it should be a legal demand upon every individual and enforced by penalty for neglect or refusal so to do, respectfully offers the following report:

Nearly all physicians, doubtless, when first considering the question, would say that it would be an easy matter to secure vaccination of the entire population if the law made it obligatory. The vast majority of physicians who have investigated the subject, however, believe that compulsory vaccination will, in a large measure, fail in accomplishing the most desirable result of general vaccination of the populace. Especially is this true "in this democratic republic of ours, in which, by a political fiction, every citizen is declared to be a sovereign."

The question must be considered from two stand-points, *i. e.*,—

1. The ignorance of the populace as to the safety, value, and facility of vaccination.

2. A wrong-headed perversity, which leads a certain class of people to oppose everything required by law, for the sake of glorifying themselves as reformers.

Upon the first difficulty, every one must admit that the average citizen is lamentably ignorant of the fundamental questions upon which the practice of vaccination is founded, and therefore he is shamefully negligent in applying the remedy which we have in this beneficent measure. The prejudice of the people against vaccination is mainly due, 1, to a belief that syphilis, scrofula, consumption, bovine diseases, etc., are commonly transmitted to the vaccinated subject; 2, to a distrust in the power of vaccination to prevent or control small-pox. The remedy for such prejudices is to be found in educating the people upon these vital questions.

The second difficulty to be overcome in securing general vaccination,—*i. e.*, perversity, leading to opposition to compulsory measures,—is not so easily met. The fanatic and the demagogue are ever ready with the

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cry of infringement of personal liberty. In America, the demagogue is ready to proclaim that all such measures are contrary to the genius of our form of government. Let us dwell for a while upon this objection.

"The assumption that the individual has the right to protect, or abuse and neglect, *his own* health at pleasure, is false in morals, and, as we believe, equally in opposition to the social and statutory law. And, as a numerous population is of the highest importance to the strength and welfare of a nation, it should be the anxious study of legislators to favor that end by the enactment of such laws as will best protect the health and lives of the people. It is a well known fact in the economy of population, that the conditions which most favor the multiplication of the human species are health, the enjoyment of peace, and an abundance of food; and, *per contra*, of necessity, the conditions which most seriously retard the increase of population are pestilence, war, and scarcity of food.

"The Eastern nations were, from the earliest ages of historic record, visited by occasional pestilential plagues, so terribly devastating in their career as almost to depopulate whole cities and extensive districts of country. Yet historians do not hesitate to say that, vast as was the mortality from the plague, it was even exceeded by that of small-pox. * * * Up to the last one hundred and fifty years it was the most frequent, the most fatal, and the most injudiciously treated of all the pestilences that have afflicted mankind. * * * Notwithstanding the accumulated experience of practice, the medical profession during all that time had discovered neither preventive nor cure, remaining a sad spectator of its desolations, and utterly unable to afford relief. It defied alike the measures devised by civil rulers, and the appliances of medical science, continuing for ages unimpeded in its work of death and disfigurement.

"There may be some diversity of opinion as to the steps proper and necessary to be taken to secure every individual in society the full protection which a successful vaccination gives against variola, though to our minds it is clearly a question to be settled by our legislators, upon the principle that it is their duty to secure the greatest good to the greatest number. In this particular instance all would be benefited, and none injured. With us the belief had become prevalent that the temper of the American people would not tolerate any interference on the part of government in matters of a purely personal and domestic character. The experiences of the last few years, however, shows us to be as submissive to the will of rulers and governments as any people on earth. There is not only wisdom, but a necessity, for a people loving liberty and cherishing independence, to guard with jealous care every encroachment upon their political rights and constitutional privileges; but it is believed that similar reasons would not be urged or found pertinent against hygienic measures, which aim to secure the health of the individual, while equally protecting that of the whole community. * * *

"The medical profession is unanimous in the belief that the universal

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application of the vaccine prophylactic, and the repetition of it at proper intervals of time, will ultimately exterminate the small-pox from among us, or render it entirely harmless. This belief is not founded upon theory alone, but upon the experience and accumulated evidences of its power, gained by practice and observation during nearly three quarters of a century. * * * A practice that has proved successful in protecting large bodies of moving troops throughout all their departments, can be made equally efficient in protecting every member of society. The experience which has been gained on the subject of vaccination and revaccination, and its prophylactic efficacy when recently performed, warrant the profession in entertaining the confident belief that variola can be annihilated, or rendered harmless, if the authorities will enforce universal vaccination. The individual who is not protected from small-pox by vaccination, or who has not had that disease, is in a condition liable on the slightest exposure to be attacked, and thus become the centre and source of spreading a loathsome malady which may destroy the lives of others. The question of the prophylactic power and safety of vaccination is so well settled that the individual who fails to protect himself against variola by it should be looked upon by the community with aversion, and treated as a nuisance (as he really is, so far as the social interests are concerned), and be compelled to submit to vaccination for his own safety and the protection of the public."[1]

Again, in the language of John Simon, chief medical officer of the privy council of England, than whom there is no higher authority in the world: "Persons unacquainted with the circumstances under which this law was made have doubted whether it was not an improper restriction of personal freedom. It being assumed as the limitary principle of human law, that men may be left free to follow every inclination which relates only to themselves, it would certainly seem foreign to the province of legislation to insist on one's caring for one's own health; and if a man having small-pox could affect none but himself, little need be said against his right of having it *ad libitum*. Even in this light, however, it deserves consideration that he who indulges a preference for small-pox does so to the detriment or danger of his neighbors; and as they often suffer by his infection, so they might reasonably claim to be heard on that question of his privilege. Still the main object of the obligatory law, as I understand it, is not to prevent adults from cultivating (if they be so minded) a personal taste for small-pox. Its object is to prevent them from compelling (for, in this case, allowing amounts to compelling) their children to incur the worst perils of that disease. The interference of the law was an interference between parent and child—a kind of interference very sparingly exercised in this country, and the exercise of which on slight grounds would of course be intolerable. The practical justification of any such law depends on the amount of evil which it is designed to correct, and four or five thousand annual deaths (in England), by one specific parental omission, constituted in this case

[1]*Compulsory Vaccination*, by J. M. Toner, M.D., Washington, D.C.

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a strong argument. It was under pressure of this appeal that the compulsory vaccination act was passed. The option which the new law restricted was not that of a conscious agent deliberately preferring for himself the dangers of small-pox to the securities of vaccination. The thousands who annually died of non-vaccination had never raised their voices for the privilege of unrestricted small-pox. The so-called 'liberty,' thenceforth to be abridged, was that of exposing unconscious infants to become the prey of a fatal and mutilative disease. It was this liberty of omissional infanticide which the law took courage to check."

Or, as Dr. J. M. Toner, of Washington, D. C., puts it,—"Parents and guardians have no more right to withhold or neglect to provide vaccination for the children under their protection, than they have to jeopard the lives of these helpless infants by not furnishing them with food or clothing. It is criminal to neglect either, as death may be the consequence; but the failure to provide protection against small-pox seems to be more maliciously wicked than to neglect either food or clothing, as the former may not only cause the death of the child, but be the means of spreading disease and death among many others; while the evil which arises from the latter ceases with the death of the victim."

Considerations such as these have caused various governments to make and execute laws partially or wholly compulsory of vaccination. In England the law is that every child must be vaccinated before it reaches three months of age. Whenever a child of three months of age is found unvaccinated, it becomes the duty of the vaccination officer to give a notice to the parents or guardians to have the child vaccinated within a specified time. If the parent or guardian fails to comply with the notice so given, the delinquent is summoned before a magistrate for trial, and if convicted incurs a penalty of twenty shillings. If the delinquent continues in his refusal to have the child vaccinated, he is subject to fine, or imprisonment, or both, at the discretion of the court. If the effort at vaccine infection fails, the operation is to be repeated until successful vaccination is secured, or the child is found to be insusceptible to vaccine infection.

Vaccination is compulsory in Scotland, and all children must be vaccinated at six months of age. All children in Ireland, at six months of age, are compelled to be vaccinated. The method of procedure in such cases, as also the penalties, are the same as in England. The German Imperial Diet (1874) fixes the age at which all children are required to be vaccinated—the age being one year. Sweden requires vaccination of all children at two years of age. Indirect compulsory vaccination is enforced in Sweden and Belgium. This is done by education, encouragement, persuasion, reprimand, and the abridgement of privileges. It is required of every person who desires to gain admittance into any school, asylum, hospital, factory, etc., to become an apprentice, to enter the public service, or to exercise any of the rights of a citizen, that he shall show a certificate of a public vaccinator that the applicant has been successfully vaccinated.

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In France "There is no general French law relative to vaccination, only departmental regulations issued by the prefects. A certificate of successful vaccination is required of candidates for the government schools, and also in some private schools."[1]

In the United States, nearly all of the states have passed laws of compulsory vaccination, or granted to state and municipal boards of health the power so to do, under the general or special laws under which these boards are organized, giving such boards full power to institute such measures for maintenance of public health as the board may determine necessary. Louisiana has a law encouraging vaccination, but it expressly forbids compulsory methods. In this country only partially compulsory vaccination laws are enforced, except in very rare and exceptional instances. The children attending public schools are in most cities required to present certificates of successful vaccination before being admitted. But it must be readily seen that in this measure the remedy is but imperfectly applied. In countries where the school law requiring compulsory vaccination is only enforced, the small-pox death-rate of children under five years of age is fully 75 per cent. of the total small-pox mortality. As a means of preserving the lives of children under five years of age, the law is wholly inutile. It must be admitted that the compulsory vaccination law of England has not been satisfactorily received by the whole people. There we have an example of an unprecedented agitation against compulsory vaccination, taking the form of an organized and spirited opposition, and testing to the very utmost the principles involved. The law has been invoked in hundreds of instances, and the courts have invariably decided that the law was correct, and have imposed penalties in money and imprisonment. They have in England the Anti-Vaccination Society, thoroughly organized, and this society publishes a journal and numerous tracts, and with these flood the world with anti-vaccination literature. This organized opposition in England has become a troublesome obstacle to the full execution of the compulsory vaccination law. We have sought in the numerous tracts issued by the Anti-Vaccination Society the causes which have led to this opposition. We are forced to the conclusion that it has been due to the ignorance of the people, their fears and prejudices incited and intensified by having followed the lead of a few educated cranks, who never appear to their own satisfaction in public except as self-styled reformers, seeking to make capital for self by leading opposition to law. They have seized upon every case of accident resulting from vaccination, magnifying its terrors a thousand fold, and then deducing general principles from erroneous statements and individual cases. The remedy for this evil is, wherever necessary enforce unflinchingly the law, at the same time being diligent in teaching the masses the true nature and value of the prophylactic powers of vaccination, and by this slow process triumph at last.

Your committee believes that compulsory vaccination is just and necessary where large numbers of a community are unvaccinated, and seri-

[1] Letter from Dr. John S. Billings, U. S. A.

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ously threatened with an epidemic of small-pox, and the unvaccinated refuse or neglect to avail of the protection against so loathsome a disease as small-pox. We have no sympathy with the fanatic and the demagogue who would resist vaccination under the specious plea that to make it compulsory is to place an infringement upon "personal liberty." We are convinced that "liberty is a name for what no man possesses." Partial compulsory vaccination should be enforced in all communities. The public schools, asylums, hospitals, etc., being the gift of the municipality, no person should be admitted into them unless successfully vaccinated.

Your committee has the utmost confidence in the protective power of vaccination. Each of its members is qualified to express an intelligent opinion upon the subject by reason of having held positions in the public health service, and having been frequently charged with the duty of eradicating small-pox from our several communities. We declare our utter inability to suppress small-pox in a community by any other means than that of systematic general vaccination and revaccination: it being understood, of course, that isolation of the sick and disinfection of infected materials, coupled with vaccination, enable the public authorities to more speedily stamp out an incipient epidemic of small-pox. We do not believe that general compulsory vaccination could be enforced in all communities, for the following reasons:

1. The masses of the people are not yet sufficiently well informed to understand the necessity for vaccination. A law framed to protect a people against the probability of the occurrence of disease must not be too far in advance of their comprehension, or it will meet with opposition.

2. Without desiring to disparage the medical profession, we must say that too many of its members are shamefully negligent in teaching the people their duty of protecting themselves and their helpless dependents, by availing of the benefits of vaccination. Some physicians are not sufficiently versed either in the history or the practice of vaccination to enable them to form a deep-settled conviction of the necessity for the measure, except in communities imminently threatened with an epidemic of small-pox. To the honor of the medical profession be it said, that it has been the bulwark of the people in protecting them against small-pox, and its members have had to bear the false and malicious insinuations and charges so freely heaped upon them by anti-vaccinists. We point with pride to the fact that the most learned, conscientious, and humane physicians in all countries are unanimous in supporting the cause of vaccination.

3. Knowledge of human nature leads us to know that the threatening of an outbreak of small-pox is, as a rule, an effectual means to make vaccination general. The person who would wilfully and impudently defy the public vaccinator when there was no small-pox near him, would gladly seek his aid if the disease was next door to him.

4. In our judgment compulsory vaccination laws would fail to a very

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great extent in this country, at the present time, in accomplishing the ends in view in their enactment, until the public health service in the various municipalities and states is organized upon a higher plane, which shall enable every board of health to operate a fully equipped vaccination service. To this end several departments are necessary. These are, principally, (1) registration of births; (2) registration of vaccinations; (3) corps of vaccination officers for vaccinating the people; (4) corps of inspectors to search out unvaccinated children, and compel compliance with the law. There are other essentials of a vaccination service, but these are the principal ones.

Your committee would suggest the propriety of leaving the question of the propriety and expediency of compulsory vaccination to the judgment and control of the various municipal and state boards of health. These organizations are alone fully qualified to judge of the question in its various bearings in their several communities. We would urge, however, that every board of health should be by law fully empowered to enforce compulsory vaccination of the population under its control, if deemed necessary to protect the people from small-pox. The workings of compulsory vaccination in the various countries where it has been tried being directly in the questions submitted to your committee, the following examinations of the question are submitted for your consideration:

Let us briefly look at the value of vaccination under recent reputed failures to such extent as to have shaken the confidence of some few former advocates, and supplied vaccinophobists with what they term "an arsenal full of facts testifying to the utter futility of the measure." Let us take the most wide-spread and fatal epidemics of small-pox which have fastened their remorseless fangs into the bodies of communities since compulsory vaccination, and see if we can compare the results of vaccination and of non-vaccination. This is the only rational test. Ask vaccinophobists to select their own times and places of occurrence of small-pox for this demonstration, and they will point to the epidemic of small-pox in Great Britain from 1870 to 1873, and pridefully declare that in this epidemic we have an illustration of the futility of the prophylactic powers of vaccination. We accept the issue thus made, and shall demonstrate the wonderful prophylactic power of vaccination in this time (their own selection), to the satisfaction of any sane or reasonable man. Of this epidemic, Dr. Seaton, who was specially detailed to investigate it, says,—"The epidemic of small-pox, which began in England towards the close of 1870 and terminated in the second quarter of 1873, was part of a general outbreak of that disease, of world-wide diffusion, marked wherever it occurred by an intensity and malignancy unequalled by any previous epidemic of the disease within living memory. The outbreak seems to have begun in France about a year before it manifested itself in the United Kingdom. In the last quarter of 1869 it was already making considerable progress in Paris. Early in 1870 it prevailed in Orleans, Bordeaux, Lyons, and other large towns, and in the course of the year

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extended with great mortality over nearly the whole of France. Except, however, in so far as it was directly conveyed by the French prisoners to various places in Germany, there was very little extension beyond France till towards quite the close of 1870. The epidemic then manifested itself in London, in two or three of the chief towns of Holland, in Milan, at Geneva, and in some other places, becoming thereafter rapidly diffused over a great part of Europe. During 1871, England and Scotland, Holland, Prussia, and the whole north of Germany, Italy, and Spain, felt the full force of the epidemic, and the first beginnings of its ravages were experienced in some of the other countries of Europe, as in Ireland and in Denmark. In the course of this year it spread beyond Europe to various places in Africa (where it raged along the gold coast), to the West Indies and to North America. During 1872, while still continuing its course in most of the countries it had attacked in 1871, it made further extensions over the continent of Europe, invading Austria, Hungary, Russia, and Finland, over Africa and over North America: it spread, also, to South America and the South Sea Islands, and it invaded various places of the East. In 1873 the greater part of its course in Europe had been run, but there were yet, during the earlier parts of the year, various countries and districts and important capitals, as St. Petersburgh and Vienna, still under its full influence. By the middle of 1873, however, the pandemic extension of the disease in Europe may be considered to have terminated, and small-pox generally has since then been quiescent, though there have been some considerable local outbreaks."

Here, then, is, we hope, an epidemic of small-pox of wide-spread prevalence and malignancy sufficient to satisfy these anti-vaccinists. Now for the lessons taught by this truly frightful epidemic, as applied to Great Britain. Seaton says,—"The varying intensity of different epidemics of the same disease is, indeed, a well known fact, and had been illustrated, as regards small-pox, at various times, at the hospitals set apart for the treatment of that disease in London, the ordinary mortality of natural small-pox as therein observed, 35 per cent. of the cases admitted, having in certain epidemics been known to mount as high as 47 per cent., and that of post-vaccinal small-pox to increase from 7 to 10 per cent. But no experience which had been acquired in the hospital had led to the expectation that the ordinary rate of mortality to attacks would, by any epidemic influence, be nearly doubled. Yet such was the case in 1871 and 1872, in the former of which years the deaths from the natural disease were 66.2 per cent., and in the latter, 77 per cent. of the natural cases, or in the two years combined (for the admissions in 1872 were too few to form by themselves a proper basis of comparison), 67.5 per cent. of such cases. This result is stated by Dr. Munk and Mr. Marson, in their report for 1871, to have been due 'to the severity of the disease, and especially to the number of cases of malignant small-pox, the proportion of which to the other cases has been very largely in excess of anything within the experience of either of your medical officers.'"

"In the hospitals of the Metropolitan Asylum District, in which the

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cases admitted would be of a more average character, the ratio of deaths to admissions was extraordinary, amounting to 44.80 per cent. among the unvaccinated, and 10.15 per cent. of the vaccinated. The ratio in the hospitals of provincial and foreign towns generally has ranged from 40 to 50 per cent. among the unvaccinated, and from 8 to 10 or 11 per cent. of the vaccinated—enormous rates, and attributed everywhere to the same cause, viz., the unusual proportion of malignant, black, and hemorrhagic cases. In several of these hospitals the rates were as high or higher than in the small-pox hospital of London, as in the 'Barackem Lazareth auf dem Templehofer Felde,' at Berlin,—which were used as additional small-pox hospitals during the epidemic in that city, and in which the mortality among the unvaccinated was 81.25 per cent., and among the vaccinated, 14 per cent.,—and in the hospital at Leipsic, in which the mortality among the unvaccinated was 71 per cent., and among the vaccinated (including doubtful cases), between 9 and 10 per cent."

Let us now compare the mortality of this epidemic with that of other recent epidemics of the disease. Here it is: "In the thirty-three years which at the time this outbreak commenced had elapsed, from the first establishment in England of a complete system of registration of the causes of death, there had been abundant illustrations of the varying fatality of small-pox epidemics: but it had been supposed by many,—quite erroneously as it now appears,—that that period had been sufficient to exhibit the limits of the fluctuations. Only twice since the close of the great epidemics of 1837–1841 had the small-pox deaths in England exceeded 7,000, viz., in 1852, when they were 7,320, and in 1864 when they were 7,684. And though the epidemic of 1837–41, just referred to, had exhibited a mortality enormously in excess of these numbers (the deaths in 1838 alone having been 16,268), yet as this was anterior to any vaccination laws, and at a time when the proportion of the population which was unprotected by vaccination was many times as great as it is now, a recurrence of any such considerable mortality as was then observed had been quite outside ordinary calculations. The mortality of the 1870–3 epidemic has not indeed been by any means so great in proportion to population as was that of 1837–41, but it has approached it more nearly than had appeared possible. During the 1837–41 epidemic there were registered, from July 1, 1837, to the termination of the epidemic in 1841, 48,012 small-pox deaths in a mean population of fifteen and one half millions; during the 1870–3 epidemic, 44,433 deaths in a mean population of nearly twenty-three millions. The proportionate mortality therefore of the epidemic of 1870–3 has been less than two-thirds that of 1837–41."

What of the mortality of small-pox in this epidemic of 1870–3 compared with the small-pox mortality of the last century? Dr. Seaton says of it,—"The mortality of this epidemic was, as I have said, such as had not been known in England for thirty years, and has at least proved a complete answer, if indeed an answer had been required, to the notion

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which had of late years been ventilated by some that small-pox was a disease tending naturally to extinction. * * * * * But before proceeding further, it seems very important that it should be noted that the mortality of this epidemic, alarming as it has been, has not approached what was the usual annual small-pox mortality of the kingdom at the time when vaccination was unknown. The annual average small-pox death rate of that period,—not, be it observed, the death rate of a particular year of special prevalence of the disease, but the annual average death-rate,—was more than three-fold the death-rate of this in our time quite exceptional outbreak. The estimated annual small-pox death-rate of England in the last century was 3,000 per million of population; the mean annual death-rate of this epidemic was 928 per million, having in 1871 been 1,024, and in 1872, 833 per million. The average annual small-pox death-rate of the metropolis in the pre-vaccine period was from 400 to 500 per hundred thousand of population; the mean annual death-rate of this epidemic was 148, having in 1871 been 243, and in 1872, 54. And if an average be taken of the small-pox mortality of England for the whole twenty years (1854–1873) during which there has been a compulsory vaccination law, a period which includes the whole of the recent epidemic, the annual death-rate is found to be 245 per million of population, or less than a twelfth of the rate of last century."

In reckoning the success or failure of compulsory vaccination in Great Britain, we must remember that the law was enacted to protect helpless children from the fatal consequences to themselves of obduracy or carelessness of the parent in failing to protect them from small-pox by having them vaccinated. Let us take this epidemic of 1870–73, which has afforded vaccinophobists such an arsenal of facts to prove the worthlessness of vaccination, and see if in enacting compulsory vaccination laws the state exercised a wise and prudential care of its infantile population. Prior to the enactment of compulsory vaccination laws, seventy to eighty per cent. of the annual small-pox mortality of Great Britain was among children under five years old. What has been the average annual mortality in this class since compulsory vaccination? Take England first. The law requires vaccination of children at three months of age. The compulsory vaccination law of 1853 was very defective in that the machinery provided for registration of births, and vaccinations thereafter, was not such as to enable the authorities to know and secure the vaccination of all the children falling within the provisions of the law. Defective as it was in this respect, it yet had a salutary effect, for the vaccinations among this class were more than doubled over the same period anterior to the enactment of the law. It must be admitted that this result was largely due to the knowledge of parents that if they failed to comply they laid themselves liable to a penalty for such neglect. In a few years we see the annual small-pox death-rate reduced to fifty-five per cent. of the total mortality from this disease. Fifty-five per cent. remained the average annual mortality in this class until the laws of 1867 and 1871 were enacted. By the law of 1867 a full and proper system for registering compliances with

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the compulsory law was inaugurated. Boards of Guardians throughout the kingdom were authorized by law to compel such compliances, and were given full authority to appoint officers whose duty should be to rigidly inquire into all failures to comply with the law. When such persons were found, these officers should warn the delinquents to comply with the law within a specified time, and if such persons failed to heed the warning the officers were to institute legal proceedings to require compliance. By the act of 1871 Boards of Guardians were required to appoint such officers. The epidemic of small-pox commenced in the latter part of 1870, and we are told that "only a portion of the population in England under five years of age was within the operation of the act of 1867. During the continuance of the epidemic a larger proportion came under its provisions, and some came also under the provisions of the act of 1871. The result was manifested in a reduction of the proportionate small-pox mortality under five years of age from fifty-five per cent. of the entire mortality from that cause to thirty-three and one half per cent. in 1771, and to thirty per cent. in 1872. The act of 1867, being in some of its most important requirements permissive only, had been carried out with very various degrees of efficiency by different local authorities. In those places in which the action taken under it had been tardy and ineffective, the mortality in young children amounted to or approached its old proportions; in those places in which such action had been commenced immediately on the act coming into operation, and been steadily continued, a remarkable diminution in that proportion was observed."[1]

LONDON.

Anti-vaccinists gleefully ask, How about the small-pox death-rate of London in 1870–73? Let us examine into the matter. For twenty years prior to 1871, when the authorities provided gratuitous vaccination, but when compulsion was really nominal, the small-pox death-rate of children under five years of age was more than 50 per cent. of the total small-pox death-rate. From 1851–60 it was 59.5 per cent., and from 1861–70 it was 54.3. In 1871 and 1872, notwithstanding the negligence of the authorities of some of the unions in relation to enforcing vaccination, the average annual small-pox death-rate of children under five years of age to the total small-pox mortality was 36.7. In the epidemic of 1881 children under five years of age contributed only 27.8 per cent. of the total small-pox mortality of London.[2] In 1872, in Great Britain, only 85 per cent. of the births were certified as successfully vaccinated. Deducting the percentage of children having died before being vaccinated, the percentage vaccinated to the total births living was 9.4 per cent., certified as successfully vaccinated. But let us compare the relative death-rates from small-pox in London, in the epidemic of small-pox for the year ending May 29, 1881, between the vaccinated and unvacci-

[1] *Dr. Seaton's Report* in Report of Medical Officer of Privy Council, 1874.
[2] Eleventh Annual Report of Medical Officer of the Local Government Board.

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nated. Here is the table taken from the Eleventh Annual Report of the Local Government Board, 1881–82:

Death rate of people of subjoined ages.	Per million of each age of the vaccinated class.	Per million of each age of the unvaccinated class.
All ages, ...	90	3,350
Under 20 years, ...	61	4,520
Under 5 years, ...	40½	5,950

SCOTLAND.

How about Scotland? Mr. P. A. Taylor makes himself happy over the failures of compulsory vaccination in Scotland. Upon what is his opinion based? Let us see. Here is a fair test, for the compulsory vaccination law of Scotland was enacted January 1, 1864, and from that date to December 31, 1871, the report of the register-general for Scotland states, that after a deduction had been made of all children who had died before they could be vaccinated, 96½ per cent. of all children alive were certified as having been successfully vaccinated. One per cent. was certified as being in such health as to prevent vaccination, or having been repeatedly tried and found insusceptible, and 2½ per cent. unaccounted for on the registers. From this it appears that the children in Scotland under seven years of age were protected by vaccination to a remarkable degree. But, as has been well said, "it is equally obvious that the whole infantile population cannot be universally vaccinated, nor constitute a class among whom, if small-pox prevail in the country, there could be any reasonable expectation of meeting with complete exemption from that disease, for it includes (1) all who are under the age by which vaccination is enforceable, of whom, of course, a very large proportion would remain unvaccinated; (2) not a few somewhat above that age still remaining unvaccinated, from the carelessness of their parents in neglecting to have the vaccination done till they had received legal notice of warning, and risking it, probably, for some time after that; (3) children in whom there was postponement of vaccination on account of their state of health; and (4) many, doubtless, still unprotected among the cases which had appeared in each year's return as 'postponed,' 'insusceptible,' or 'unaccounted for.' Now, as there are nearly 120,000 children born in Scotland every year, who, until they are six months old, do not come under the operation of the law; as there are about 1,000 of each year's births carried on as 'postponed' or 'insusceptible;' and as there are about 2,500 annually respecting whom nothing is known,—it is quite certain that there must always, at any given time, be, among the young population of Scotland, extremely well protected as it is on the whole, a considerable actual number of unvaccinated children."

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Now for the results of this unprecedented vaccination in a community of civilians. From year to year, prior to compulsory vaccination, the average annual small-pox mortality in children under five years of age amounted to 74 per cent. of the total small-pox mortality in Scotland. To fairly test the prophylaxis afforded by compulsory vaccination, we must take the children under seven years of age, the epidemic having begun in 1871. The returns of the register-general are only divided as follows: Those under 5 years of age, 5 to 20, 20 to 60, and those above 60 years of age. We therefore take those under five years of age, they being only those which can be used to test the value of compulsory vaccination. From the enactment of the compulsory law in 1864, the mortality of this class steadily declined from 74 per cent. of the total small-pox mortality, until in the epidemic of 1871 it was for the whole of Scotland just 21.4 of the total small-pox mortality. The mortality for the whole of Scotland had not been ascertained when Dr. Seaton (from whose reports these data are extracted) rendered his report in 1874. But let us take the eight principal towns of Scotland, from which to derive further information on the subject.

SMALL-POX DEATHS IN THE PRINCIPAL TOWNS OF SCOTLAND.

Year.	At all ages.	Under 5 years of age.	Deaths under 5 years of age: per cent. of total deaths.
1871, ...	886	195	22
1872, ...	1,537	362	23.5
1873, ...	467	124	26.5
1874, to June inclusive, .	302	69	22.8
Total, 3½ years, . . .	3,192	750	23.5

Well may the register-general, in his report for 1872, say, in his comments on that year,—"If the same relative mortality had taken place in children at that age (under five years) as occurred during the previous epidemics, when they were less efficiently protected by vaccination, instead of only 362 children under five years of age having died from small-pox in the eight towns during 1872, 3,370 would have died. The enforcement of the vaccination act, therefore, during the seven previous years, appears to have had the effect, in these eight towns alone, of saving the lives of upwards of 3,000 children." So much for the direct proof from the history of Scotland as to the beneficent effects of compulsory vaccination. Now let us compare the relative mortality of children under five years of age in Scotland with other countries. A glance at the following table will show the superior effects of the law of Scotland:[1]

[1] *Seaton's Report*, 1874, already referred to.

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Towns, or groups of towns, compared.	Actual small-pox deaths under 5 years of age during the whole period of the epidemic in each town, or group of towns.	Small-pox deaths under 5 years of age during the whole period of the epidemic for equivalent population of 1,000,000 of all ages.
Eight principal towns of Scotland (population 1,083,750), 1871–'74, ...	750	692
Berlin (population 882,569), 1871–'72, . .	2,837	3,448
Hamburgh (population 338,974), 1871–'72,	1,938	5,717
Leipsic (population 106,925), 1871, . . .	659	6,200
Eight principal towns of Holland (population 693,080), 1870–'72, ...	4,474	6,445

Compare next the small-pox mortality under five years of age with the population living under that age, respectively, in the various towns or groups of towns.[1]

Towns, or groups of towns, compared.	Population living under 5 years of age.	Small-pox deaths under 5 years old during the entire period of the epidemic in each place.	Small-pox deaths under 5 years of age during the whole period of the epidemic for equivalent populations of 100,000 children under that age.
Chief towns of Scotland (3½ years), ...	147,433	750	508
Berlin (2 years), ...	88,093	2,837	3,200
Leipsic (1 year), ...	8,545	65	7,712

These are the only towns in which the data for this last table were at hand for comparison when the table was formed in 1874. Assuredly there must be some patent reason for this variable death-rate of infantile populations in the countries having compulsory vaccination laws. Let us try and find it. A brief review of the law, together with the manner of its enforcement in the respective places, will perhaps enable us to solve the problem.

(1) *Scotland.*—We have just seen the wonderful utility of compulsory vaccination in Scotland in comparison with the other countries specified in the tables just given. The law is stringently enforced, and the machinery therefor is complete, as evidenced by a vaccinated population under five years of age of 96½ per cent.

(2) *Berlin.*—In Berlin the law required that all children should be

[1] *Seaton's Report*, 1874, already referred to.

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vaccinated at one year of age. No penalty, however, is attached to neglect to comply with the law, unless small-pox follows such neglect. The delinquents were rarely prosecuted, and a good proportion failed to have their children vaccinated until they attained school age. All children seeking admittance to the public schools had to present a certificate of successful vaccination before being received therein. Dr. Guttstadt, in 1873, attributed the high mortality in Berlin in the epidemic (1871–'72) to a large accumulated number of children, whose parents had failed to have them vaccinated at one year of age, as required by law.

(3) *Hamburgh.*—There was not at the time of the outbreak of the epidemic any compulsory law, and no means to prevent parents from neglecting to have their children vaccinated, except a law which required all children applying for places in the public schools to produce a certificate of successful vaccination. Therefore it was common to find children who had attained two years of age, and often seven or eight years, before vaccination was attempted. This large residuum of unvaccinated children is sufficient to account for the greater prevalence of small-pox in Hamburgh than in those of Scotland.

(4) *Leipsic.* } The same is substantially true of these as in Ham-
(5) *Holland.* } burgh.

IRELAND.

What of compulsory vaccination in this country? triumphantly ask the anti-vaccinists. Let us test it first upon the children under five years of age, the class whom primarily the law was intended to protect. The compulsory vaccination act of Ireland came of force January 1, 1864. The machinery for registration of compliances with the law, as well as the lack of officers to warn delinquent parents whose children remained unvaccinated beyond the prescribed age (six months), and to take the necessary steps to enforce compliance with the law, shows the act to be more defective than that of Scotland.

By the report of the public vaccinators to the local government board of Ireland, compared with the register of births from 1865 to 1872 inclusive, it is shown that 81 per cent. of the births were vaccinated by the public vaccinators. (The public vaccinators do almost the entire vaccinations in Ireland, except in the large towns.) In Scotland the percentage of these vaccinations has been shown to be 96½ of every 100 births. We therefore see that in Ireland there is always a very large residuum of unvaccinated children, there being, in 1872, 33,440 children who were not vaccinated until they had attained one year of age. In 1873 there were 19,258 such cases. Let us now compare the small-pox death-rate of this class with the total small-pox mortality of the periods anterior and subsequent to the compulsory act. Seventy-nine per cent. of the total small-pox mortality of Ireland was in children under five years of age, as shown in the report of the epidemiological society in 1853. Under the medical charities act, and the act of 1858, the public vaccinators had been enabled to reduce this percentage to 75. By the operation of the

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compulsory vaccination act, in 1865 and 1866, the percentage of this class of deaths was reduced to 50. From 1866 to 1871 small-pox was almost wholly absent from Ireland. When the epidemic of small-pox began in 1871, it found the children under seven years old remarkably well vaccinated, and as a consequence we find the percentage of deaths in this class as follows: 1871, 20.5, and in 1872, 25 per cent. of the total small-pox mortality.

Now let us take Dublin, one of the cities especially pointed out by anti-vaccinists as an illustration of the utter failure of compulsory vaccination. In Dublin, in the two years in which the epidemic prevailed, there were 1,557 deaths from small-pox. Of this number 362, or 23 per cent., were in children under five years old. Dr. Seaton was unable to give the proportion which these 362 deaths bear to the total population living under five years of age. But he shows the comparative mortality to the whole population of Dublin, and contrasts these with the following places. The deaths under five years of age per million of living population in each place were as follows:

Dublin,	1,150
Eight principal towns of Scotland,	692
Dundee,	1,534
Berlin,	3,448
Hamburgh,	5,717
Leipsic,	6,200
Chief towns of Holland,	6,455

Let us see what has been the result of compulsory vaccination upon the whole population of Ireland. From the census taken in 1841 it was shown that for the previous ten years small-pox was the second most fatal disease in Ireland. The deaths in that period of time were 58,000. When the census was taken in 1851 it was found to be the third most fatal disease. For nineteen years previous to the act of 1863, the average annual mortality from small-pox was, as shown in the twenty-first annual report of the poor law commissioners for Ireland, 2,640. The compulsory vaccination act of 1863 came of force at the time of decline of a considerable epidemic. During the first year, which, it must be admitted, was too soon to be fairly claimed as wholly consequent upon the operation of the act, the deaths from small-pox were 854. From 1865 to 1870, inclusive, the small-pox mortality had fallen to such an extent as to be without precedent in the history of Ireland, being for the six years respectively 347, 180, 20, 19, 20, and 32. In the epidemic of 1871–'72 the deaths from small-pox were 665 in 1871, and 3,248 in 1872. Now let us compare the small-pox mortality of Ireland previous and subsequent to compulsory vaccination, and see what will be the result of the investigation. For nineteen years previous to compulsory vaccination the average annual deaths from small-pox were 2,624; for ten years subsequent to compulsory vaccination the annual small-pox deaths were 583.[1] Therefore we see that under compulsory vaccination for the ten

[1] See *Seaton's Report*, 1874.

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years of its operation, as compared with the nineteen years anterior to it, the deaths were not a fourth of those in the non-compulsory period.

Your committee has no hesitation in saying that, even in the trying period of this unexpected and malignant epidemic, the compulsory vaccination laws of Great Britain have been a decided success, and have saved thousands of lives, which would have been sacrificed to small-pox but for its beneficent provisions. Especially is this true of the helpless infant population, which by its very helplessness is the more entitled to the fostering care of the nation.

All of which is respectfully submitted,

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EFFICIENCY AND SAFETY OF VACCINATION.

(SUPPLEMENTARY REPORT.)

From the discussions of the preliminary reports of committee on compulsory vaccination, to be found in proceedings of last two meetings, it seems that it was desired of this committee to consider and answer the objections urged against vaccination by anti-vaccinists. The alleged inefficiency and dangers of vaccination have in some respects greatly retarded the cause of vaccination, and these allegations should be fully and honestly examined. To this purpose the following supplemental report is offered, especially as the report only deals with the question of efficiency of vaccination under its most trying ordeals.

Mr. P. A. Silfestrom (whom the *Vaccination Enquirer*, the journal of the anti-vaccinists, says is "one who has mastered the vaccination question") says,—

"It has been proved,—

"1. That disease (especially erysipelas and syphilis) and death have not infrequently been observed to result from vaccination."

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[Mr. P. A. Taylor, M. P. (another leader of the anti-vaccinists), says,—"Not tens, but hundreds and thousands, of persons in this country (England) have mourned the death or ruined health of their children through the results of vaccination."]

2. "That the practice of vaccination affords no national protection from small-pox, and has had no effect whatever in preventing or diminishing small-pox epidemics.

3. "That the mortality among vaccinated small-pox patients is as great as among unvaccinated.

4. "That small-pox mortality has exercised no perceptible influence on the average general mortality."

These propositions will be reviewed in the following examination:

HISTORY OF SMALL-POX PRIOR TO VACCINATION.

In order to an intelligent presentation of the subject, it is necessary that we take a hasty glance at the history of small-pox prior to inoculation and vaccination.

For centuries prior to vaccination small-pox had been justly regarded as the king of fatal diseases. We are told by M. de LaCondomine that small-pox was the cause of one tenth of all the deaths among mankind. He further says,—"Among those who outlive it, many either totally or partially lose their sight or hearing; many are left consumptive, weakly, sickly, or maimed; many are disfigured for life by horrid scars, and become shocking objects to those who approach them. Immense numbers lose their eyesight by it." Half a million deaths were annually caused in Europe from small-pox prior to the discovery of vaccination. Macaulay, in speaking of small-pox in England, says,—"The havoc of the plague had been far more rapid, but the plague visited our shores only once or twice within living memory; but the small-pox was always present, filling the churchyards with corpses, leaving on those whose lives it spares the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to her lover."

Rosen says that in Sweden one tenth of all the deaths was from small-pox. We are assured that that this disease concurred with fire and sword, and famine and blood-hounds, to complete the depopulation of St. Domingo.

In the sixteenth century small-pox fell upon Mexico, and in a few years three million five hundred thousand of the population yielded up their lives to it, leaving in some places scarcely enough people alive to bury the dead. Brazil, in 1653, was invaded by small-pox, and in some instances whole races of men were carried to their graves by it. The Province of Quito, in a few years, lost one hundred thousand of her Indian population by this one disease. In 1707 Iceland was invaded by small-pox, and desolation and ruin followed in its wake for years, causing in 1707 the death of eighteen thousand out of a total population of

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fifty thousand. The fearful fatality of the disease is evidenced by the following extract: "In one island they found one girl, with the small-pox on her, and her three little brothers: the father having first buried all the people in the place, had laid himself and his smallest sick child in the grave, raised with stones, and ordered the girl to cover him." Greenland, in 1734, lost more than two thirds of her population by small-pox. We are told, also, that one sixth of the inhabitants of Ceylon died of small-pox. Siberia has nearly an equally blood-curdling history. Kamschatka has felt a like heavy hand from this terrible disease. One tenth of all the deaths in France, prior to vaccination, were from small-pox. This country has been most cruelly and fearfully scourged by small-pox, the details of which must be too well known to need repetition here. Whole tribes of our Indian population were swept out of existence by it. Europe, in the century preceding the discovery of vaccination, lost in deaths from small-pox 50,000,000 of her population. But it is unnecessary to sicken the heart with recital of such details. Enough has been presented to justify Macaulay in calling small-pox "the most terrible of all the ministers of death." Suffice it to say, small-pox prevailed in all countries, spared neither the babe at the breast, the youth, nor maiden, the father nor mother, the priest nor layman, nor the white heads of the old and trembling man or woman, for it was remorseless in the vigor with which it swept the aged into the grave. Whenever and wherever it appeared in the past, in a community unprotected by vaccination, it is well described by Alexander McKenzie, *i. e.*,—"It was as a fire consuming the dry grass of the field. The infection spread with a rapidity which no flight could escape, and with a fatal effect which nothing could resist." McKenzie says of the Indians,—"It was not uncommon for the father of a family whom the infection had not reached, to call them around him, to represent the cruel sufferings and horrid fate of their relations from the influence of some evil spirit who was preparing to extirpate their race, and to incite them to baffle death, with all its horrors, by their own poniards. At the same time, if their hearts failed them in this necessary act, he was himself ready to perform the deed of mercy with his own hand, as the last act of affection, and instantly to follow them to the common place of rest and refuge from human evil."

After centuries of havoc from small-pox, variolous inoculation was introduced, and the mortality per thousand greatly lessened. But it was reserved for the philosophical mind of the immortal Jenner to evolve from the story of the humble milk-maids of a country district of England the simple, harmless, and glorious discovery of vaccination. Upon hearing the story of the milk-maids, their assertions of the protective powers of cow-pox against small-pox made an impression upon his mind which was the source of much thought. Believing in the possibilities of vaccination, he so persistently brought the subject to the attention of the medical society of which he was a member, that he was threatened with expulsion as a bore. The year 1796 was the birthday of vaccination.

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With the scoffings and tauntings of the populace, who, in the recess of his great heart he so yearned to benefit, called a villain for attempting to engraft the disease of the brute upon the human system, met with the assertion that small-pox was a necessary process of depuration to the blood, and that death should be visited upon him for his brazen impudence, Jenner dared to defend the right, and gave through his trials and sorrows to the world, without money and without price, the greatest blessing mankind has ever known. With all the violent opposition which he was daily meeting, Jenner never flagged in his efforts to force this blessing upon his fellow-man. Being invited to test his discovery, he gladly accepted the invitation. After vaccinating a number of persons, and they going through the genuine vaccine disease, he subsequently inoculated them with the virus of small-pox, and failed to develop small-pox in a single one of them. Within six years of this demonstration, vaccination was known and practised in nearly every portion of the world.

VACCINAL SYPHILIS.

Let us now consider this objection to vaccination, *i. e.*, transmission of diseases, such as syphilis, scrofula, consumption, etc. This is a weighty and momentous objection, if it can be demonstrated by reliable investigation that either of these diseases occurs frequently as the result of vaccination. In the discussion of this question we shall deal almost exclusively with the production of vaccinal syphilis, as this is the great bug-bear used to prejudice the populace against vaccination. We are told by vaccinophobists that syphilis has been thus transmitted to thousands upon thousands of persons. Indeed, if one listened to their insane delusions, he would imagine that our race is but a seething mass of syphilitic putridity, caused by a horrid little operation called vaccination. It does seem that these deluded dwellers in "Fool's Paradise" are ready to make any sort of statements to sustain their opposition to this measure, and the more improbable and untruthful the statement the louder they proclaim it. The charge of such transmission is older than vaccination, for it was urged as an objection against inoculation prior to the discovery of vaccination.

Now to an examination of the charge of transmission of syphilis by vaccination.

The medical literature of every civilized nation has been ransacked for the purpose of substantiating this charge. "The London Society for the Abolition of Compulsory Vaccination," ever active in seeking and disseminating all information detrimental to the cause of vaccination, has put together all cases of alleged vaccinal syphilis which its active investigators could hear of. Here is the original paper from that society, received by one of your committee within the past six months, *i e.*,—

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VACCINO-SYPHILIS.

The following is a list of authenticated and published cases[1] of transmission of this one disease alone:

Lancereaux has published the following cases of vaccino-syphilis:

By Cerioli,	40	By Lecoq,	2	By Chassaignac,	1
" Tassani,	46	" Galligo,	14	" Hérard,	1
" Surgeon B.,	19	At Rivalta,	46	" Adelasio,	2
" Hübner,	8	By Trousseau,	1	" Monell,	1
" Marcolini,	40	" Maronni,	34		
" Viani,	2	" Devergie,	1	Total,	258

To these may be added the following:

By Hutchinson,	24	At Lebus,	18	By Fuqua,	52
" T. Smith,	1	By Depaul,	59	" Cullimore,	1
" Hulke,	1	" Sebastian,	1	In Algiers,	58
" Oldham,	3	" Collins,	2		
				Total,	478

M. Briquet appropriately says,—"A competent observer, and a complete observation, reported with such details as render the statements capable of being checked by the reader, are indispensable requisites for establishing the reality of an ordinary fact in medicine; and if for establishing an ordinary fact, how much more when the facts alleged are confessedly so rare, and so contrary to all previous experience, as these must be admitted to be." To correctly investigate the question of vaccinal syphilis, we must first determine the question of inoculation of the lesions of secondary syphilis. Experiments by competent observers have demonstrated that condylomata, ulcerated tubercles, psydracious pustules of ecthyma, pustules of acne, mucous patches, and the blood of syphilitic subjects, may be inoculated into the constitution of the person not already infected with syphilis. Now, it is an admitted principle in the teachings of syphilography that the secretions from pathological lesions, not themselves syphilitic, although occurring upon the bodies of syphilitic persons, do not contain the virus of syphilis, unless admixed with blood. Gonorrhœa upon a syphilitic patient reproduces gonorrhœa by inoculation, and not syphilis; and the same is true of chancroid. All of these lesions of secondary syphilis, except the blood, may be eliminated from this discussion, for we cannot imagine how any other of them could contaminate vaccine matter in its rational propagation.

Is the effort to inoculate a healthy person with syphilitic blood invariably successful? and, if not, what proportion of success will attend these efforts? The following presents the results of all such efforts to be found detailed in the most authoritative works upon syphilis:

[1] These cases have been fully examined, and a brief analysis of some of them will be presented further on.

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Name of experimenter.	Number of inoculations.	With success.	Without success.
Anonymous Surgeon of the Palatine, .	9	3	6
Waller, ...	1	1	. . . . .
Gilbert, ...	1	1	. . . . .
Pellizzari, ...	5	1	4
Lindwurm, ...	1	1	. . . . .
Thiry, ...	4	. . . . .	4
Lalagade, ...	3	. . . . .	3
Diday, ...	20	. . . . .	20
Total, ...	44	7	37

Thus, gentlemen, we see that where intelligent physicians, bold enough to test the matter, after deliberately and carefully endeavoring to produce syphilitic infection by inoculating healthy subjects with syphilitic blood, failed in 84 per cent. of all such efforts, only those efforts were successful where, as by Pellizzari, the anonymous surgeon of the Palatine, Waller, and others, large surfaces were denuded, and syphilitic blood in large quantities kept for many hours to the denuded spots.

It is, of course, impossible in this discussion to enter into an extended or minute examination of the cases of alleged transmission of syphilis by vaccination. The following embraces nearly if not the entire list of reporters of vaccinal syphilis, as given in the best works upon syphilis, *i. e.*,—

Name of reporter.	Number vaccinated.	Number infected.	Number not infected.
Cerioli, ...	46	40	6
Tassini, ...	64	46	18
Surgeon B., ...	24	19	5
Hübner, ...	13	8	5
Monell, ...	1	1	. . . . .
Marcolini, ...	40	40	. . . . .
Viani, ...	2	2	. . . . .
Lecoq, ...	2	2	. . . . .
Galligo, ...	14	14	. . . . .
At Rivalta, ...	63	46	17
Trousseau, ...	5	4	1
Marone, ...	34	34	. . . .

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Name of reporter.	Number vaccinated.	Number infected.	Number not infected.
Devergie, ...	1	1	. . . . .
Chassaignac, ...	1	1	. . . . .
Hérard, ...	1	1	. . . . .
Adelasio, ...	2	2	. . . . .
Totals, ...	313	261	52

HUTCHINSON'S CASES.

Series of cases.	Number vaccinated.	Number infected with syphilis.	Number not infected with syphilis.
First, ...	12	10	2
Second, ...	26	9	17
Third, ...	13	1	12
Fourth, ...	Unknown.	1	Unknown.
Fifth, ...	"	2	"
Sixth, ...	"	1	"

It is absolutely necessary, in an "investigation of alleged cases of vaccinal syphilis, to ascertain (1) whether we are really dealing with syphilis; (2) whether, if this be so, the syphilis is not hereditary, and a mere coincidence or evolution of vaccination; (3) whether, if it be acquired syphilis, this has not some other origin, unconnected with vaccination, or attempt to vaccinate; (4) whether, if the acquisition of syphilis be reasonably traceable to vaccination, or attempted vaccination, there is evidence, direct or presumable, that the so-called vaccination had been done from a genuine vaccine vesicle, and that the products of that vesicle had not been mixed with some of the inoculable products of syphilis. Not till all this was settled, would any question arise about admixture of blood. The interest and importance, after all, of the cases in which vaccination is alleged to have communicated something besides its own infection, turn entirely upon whether the vaccination had been performed with unmixed lymph of genuine vesicles—vesicles about which no competent person would make a mistake."

Seaton (Handbook of Vaccination) appropriately says,—"It must obviously be impossible to discuss at length, within such limits as in a general treatise of this kind could be allowed, all the cases that have been cited as evidences of the communicability of syphilis by vaccination. The

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most satisfactory course will be to examine carefully three or four cases, typical of the kinds of proof which have been advanced of this occurrence."

The following is an extract from his review of alleged cases of vacinal syphilis: "(1) An epidemic of syphilis reported by Cerioli as having occurred in 1821 (inquiry made eight months after its origin. The account given of this epidemic is of the loosest kind; it was not proved, or even alleged, that the child, from whom the lymph supposed to have been the origin of the outbreak was taken, had ever had syphilis); (2) another epidemic in 1841, seen also by Cerioli (investigated likewise after a very long lapse of time), the child from whom the lymph was taken never had syphilis; but it was said that a year before his father had had syphilis."

Surgeon B.: "It appears that in a town in Germany twenty-four people, belonging to different families, were in February, 1849 (some on the 13th, some on the 14th, and some on the 15th), revaccinated, as they supposed, by him. There is no statement of vaccine vesicles having been produced in one of the cases; but at the end of three or four weeks (*i. e.*, the ordinary period of incubation of syphilis), ulcerations of a syphilitic character began at the points of inoculation in nineteen out of twenty-four persons operated on, and these were followed in due course by constitutional syphilis. Here was syphilis, but no vaccination. What could have been the cause of it? The vaccinator who was inculpated asserted that the operations were all done with lymph from a child who was *fort et sain*, and who, having been vaccinated on the 4th of the month, had regular vaccinia. We shall see immediately how far this statement was borne out; but it must first be noted—and is an illustration of the want of precision generally attending these accounts—that we are nowhere distinctly told whether the so-called vaccinations, or any, or which of them, were done direct from the child, or whether the stuff taken from it might not have been collected on glasses, points, or tubes. For all that appears to the contrary, there was at least the possibility of a mistake (such as has happened many times with regard to the matter of other inoculable diseases) of taking lancets, or glasses, or tubes charged with one kind of inoculable matter instead of another. But, assuming that the matter used came from the source indicated, what was the state of this source? Though it was said to be from an infant *fort et sain*, and that this was *sura bondammet démontri par plusiers témoins*, a different account was given by other witnesses; and a doctor, who saw the child on the 21st of February, a week after the lymph was taken off it, when of course no suspicion of anything wrong had yet arisen, testified to the existence of some erythematous eruption, which was said to be like syphilitic roseola, and it died on the 24th, three days after his visit, of hydrocephalus. But, more importantly, what was the state of its arm? It turned out that, according to an eye-witness, there was on the eighth day of the child's vaccination not a vestige of vesicles, *aucune trace de boutons*, and yet two days later, the account tells us,

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several vaccinations were performed from it, and lymph continued to be extracted from it for two days."

"In Hübner's case,—a case also of malpractice,—there could be no doubt of some children having been syphilized, but no investigation of the circumstances was made till eight months afterward, and the account of the so-called vaccinations (in most of which it is quite certain, and admitted, there had been no proper vaccine effect), was only what could be got from the statements and recollections, at that interval of time, of the mothers."

Trousseau's case: "A young woman was under treatment in the wards of the *hôtel-dieu* for a uterine affection, apparently of a non-specific character, at a time when there were some small-pox cases in the hospital, and wished to be revaccinated. This was done by three punctures on each arm, from a child healthy at the time, and which, for anything that was ever known, never exhibited any taint. Four children, who were vaccinated with its lymph at the same time with this young woman, went through vaccinia in its regular way, and never had any subsequent syphilitic affection. On the young woman's arm slight papules only arose, and the revaccination was looked upon as having failed. She remained in the hospital a month after vaccination, fully the time necessary for the syphilis, if there had been any imparted by the vaccination, to have incubated, and she went out without anything the matter on her arms. At the end of another month, she attended at the hospital for treatment of her uterine complaint, and showed them two sores on one of her arms, the character of which was not at first recognized, but which turned out to be undoubtedly syphilitic. It was not known at the time, but was afterward ascertained, that she was a young woman of very loose character. Now, assured by no one who knows in what extraordinary situations chancres have been met with,—such as the cheek, the corner of the eye, in every sort of situation in which there could not be any, and never was any, suspicion of vaccination,—can say this was a case entirely free from fallacy as to the source of the syphilis."

"The occurrences at Rivalta, to which so much interest has attached, were of a different kind. In 1861 there occurred in this village a very remarkable syphilitic epidemic. Three similar epidemics are said to have been noticed in different places before,—in 1814, 1821, and 1841,—and if we include an account given (though not till some years after the occurrence took place) by a Dr. Marone, a fourth in 1856. It is certainly very singular that all these epidemics should have occurred in Italy, and none resembling them met with elsewhere. Whatever their origin, the facts are of the deepest interest;—a number of children affected at one time with syphilis; these infecting their nurses and mothers; the mothers infecting their husbands; the children infecting one another by the act of kissing, or by the spoons used in feeding; and whole families infecting one another by merely being huddled together in confined and crowded dwellings. For it must not be supposed that only persons who

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were at the time the subjects of vaccination were the sufferers. Various epidemics of this kind, quite as singular and quite as inexplicable, have occurred under circumstances entirely unconnected with vaccination, and indeed before vaccination was ever heard of. * * * In the five epidemics specified in the beginning of this paragraph, a vaccinal origin was alleged; and this was made in the Rivalta case the subject of careful inquiry by a scientific commission. Unfortunately, however, the inquiry did not take place till four months after the outbreak; and as in no single case of the children said to have been syphilized by vaccination had any application been made to a medical man on account of the condition of the arm, facts and dates on the exactitude of which everything depends had to be got as they could at such distance of time from the testimony of the villagers, for the most part ignorant and prejudiced. Under these circumstances, it is not surprising that different conclusions were arrived at; and though Dr. Pacchiotti and the other commissioners, after a most careful and painstaking inquiry, reported themselves satisfied of the vaccinal origin of the disease, Sperino, who also went to Rivalta and there investigated the circumstances, and treated some of the cases afterward at Turin, was equally satisfied that their origin was independent of the vaccination. The story, as regards the vaccinal origin, is this: A child (Chiabrera) apparently in good health, but really incubating syphilis, was vaccinated with some lymph obtained in a tube; this child's arm was used on the tenth day for the vaccination of forty-six children, and one of these forty-six children, named Manzone, again, on the tenth day, furnished lymph for vaccinating seventeen children. Of these sixty-three children, forty-six had, within two months, a disease considered by the commission to have been syphilis,—the syphilitic symptoms having manifested themselves in some cases within ten days, and as a mean at twenty days from the vaccination. Now, in explanation of these events, can we admit that the matter taken from Chiabrera's arm contained the contagion of the constitutional syphilis, which at these intervals of time the children manifested? Not, assuredly, unless we are prepared to give up all we have been taught as to the incubative period of constitutional syphilis. For it would have required from three to five weeks for that disease to manifest its primary symptoms. [Lee gives the period of incubation at from three to seven weeks. Rollett gives a mean of twenty-six days, and out of a large number of cases there was only one case in which it was under fifteen days. In four cases, in which the inoculation was by blood, the minimum was twenty-five days and the maximum thirty-five. As recent testimony on this point, it is proper to state that Hutchinson says, "The period of incubation, prior to the first specific induration, will usually be about five weeks."[1]] But if this teaching has been erroneous, and true constitutional syphilis can produce its primary symptoms within ten days, then, indeed, we can understand how, if syphilitic matter was mixed with the lymph, either in the original tube or through the lancet employed in Chiabrera's vaccination, an

[1] Rollett's *Traité des Maladies Vénérienne.*

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irregular vesicle might result, such as that stated in Sperino's experiment with soft chancre, which Baumés and Viennirs held to contain the two viruses mixed. It must be remembered that we have no reliable account whatever of what was the sort of vesicle or result on Chiabrera's arm, from which the so-called vaccinations were done. From such a result as Sperino's experiment affords,[1] a careless man might, a careful man would not, take what he called lymph; and I have very little faith in the proceedings of any one who evidently habitually used tenth-day cases. We might not really, then (that is, supposing the incubation difficulty got over, which it must be, or else the Rivalta cases as connected with vaccination fall of themselves), have any difficulty in accounting for the propagation of syphilis, for hard and soft chancres would fall in the same catagory. But we should have more hesitation as to whether vaccinia also might be communicated at the same time; and, in fact, in what degree the Rivalta children, who were syphilized, were also vaccinated, it is impossible to say. I can quite conceive that if the vesicle on Chiabrera's or Manzone's arm was at all like that produced in Sperino's experiment, some spurious vaccine result might follow in some of those vaccinated from them. There is certainly no satisfactory evidence of any of the children ever having had regular vaccinia."

HUTCHINSON'S CASES. *Quoted from Illustrations of Clinical Surgery. By Jonathan Hutchinson, F. R. C. S., 1877.*

First Series.—Patients first seen seven weeks after vaccination. Vaccinifer four months old, healthy looking, vesicle eighth day lymph. To the vaccinator and the surgeon, she, at the time the lymph was taken, bore the aspect of excellent health. All of the vesicles from which lymph was taken bled. Two months afterward, Mr. Hutchinson saw vaccinifer. "My attention was, however, at once attracted to a slight peculiarity in the tint of her skin and to the look of her face; and although it was strongly denied that she had ever 'snuffled,' yet when she was made to cry I noticed a nasal twang which was very suspicious. On having her stripped, not a single spot of rash could be seen on her skin, but on inspecting the buttocks five small circular condylomata were discovered close to the anus, about which there could not be the slightest doubt. Mother detected condylomata about a week previously, but declared infant had never been ill. I could not find in the mother herself any indications of syphilitic taint, nor obtain any history of suspicious symptoms. Did not have opportunity to inspect father. A fortnight later, sought child at its home. The child then looked more ill than when first seen: the condylomata were in the same condition. It had no rash. Its head was enlarging, and its mother complained that it was wasting away. About the existence of constitutional syphilis in the infant at the date of my examination (two months after vaccination) there could not be any doubt, and scarcely any as to the taint having been an

[1] Page 348.

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inherited one. There can, I think, be little doubt that in this insance it was the blood, and not the vaccine lymph, which was the source of the contamination.

Second Series.—Patients seen about seven weeks after vaccination. History of vaccinifer: Child stout, well-grown, seven months old; selected as vaccinifer from amongst several others, as being most healthy present. Excepting a little transitory "tooth-rash," probably lichen, on the face, he had no eruption. His head was decidedly large, and the fontanelles widely open. Mother said this had been noticed for a few weeks. Mother said "he had snuffled a great deal." No trace of rash on child's skin, but at anus there was a single small condylomatous patch just healing. Saw infant several times during six weeks after this first examination, but no symptoms of a more definite character showed themselves. The condyloma soon healed, and, with the exception of a slight tendency to hydrocephalus, the infant, at time I last saw it, might have been regarded as a specimen of excellent health. Several persons vaccinated from it mentioned that it was very healthy looking at time lymph was taken. No trustworthy evidence could be obtained as to whether blood was or was not transferred in the operation of vaccination. No syphilitic symptoms found in either parent. Father denied ever having had venereal disease, and submitted to personal examination at my office, and we failed to detect anything of a nature to cast suspicion on his denial.

Third Series.—Patient seen three months after vaccination. History of vaccinifer: Vaccinator says vaccinifer was a model of vigor and health. He presented child to me. I found a very large and very fat baby, eight months old. It had no rash, nor any trace of condyloma, and the only point about it suggestive of syphilis was the state of the bridge of the nose, which was decidedly broad and sunken. Mother appeared in good health; says the first two children died in infancy. This is only child living.

Fourth Series.—(One case.) Patient first seen nineteen months after vaccination. History of vaccinifer: Patient says vaccinifer puny at time of vaccination, and the mother ill. Does not know if vaccinifer's arm bled or not. Vaccinator denied that child looked puny at time of vaccination. Patient was probably last but one out of considerable batch vaccinated from child. Mother of vaccinifer had borne three children previously. The eldest is a boy ten years old; has no symptoms of syphilis. Second child still-born. Third child a girl four years of age, who had no special symptoms in infancy excepting that for several months during teething she had very troublesome ulcers at the anus (condylomata); also had tendency to water on the head. Vaccinifer (fourth child) was four months old at date of vaccination, and appeared, according to the mother's statement, to be perfectly well. Subsequently, however, when dentition commenced, he, like his elder sister, had very troublesome sores about the anus, and a tendency to water on the head. For the anus he was three months under treatment at a dispensary. At

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twenty-three months of age patient is living, full-grown, and shows no peculiarities excepting a large forehead. Surgeon who treated child for trouble of anus says vaccinifer had syphilitic condylomata, snuffles, a slight skin-rash, and was very cochectic when he treated him. He did not ask the parents any direct questions, because he was perfectly certain as to the nature of the ailment.

Fifth Series.—(Two cases.) Patients first seen seven months after vaccination. Surgeon which did the vaccination could give no important facts. (History of vaccinifer entirely unknown to Mr. Hutchinson.)

Sixth Series.—No history of vaccinifer could be given, as lady had been vaccinated in India.

In contrast to these cases of alleged transmission of syphilis by vaccination, the following, a few of quite a number of cases, are cited, in which physicians of the highest professional standing took as vaccinifers persons known to be syphilitic at the time, and from them vaccinated a number of persons known not to be syphilitic, and failed to develop the slightest manifestation of syphilis in any one of the persons so vaccinated.

Name of experimenter.	Number of vaccinations.	Number infected with syphilis.	Number not infected with syphilis.
Bidard, ...	6	. . . . .	6
Mountain, ...	30	. . . . .	30
Schreirer, ...	2	. . . . .	2
Jonkoffsky, ...	57	. . . . .	57
Delzenne, ...	9	. . . . .	9
Bourguel, ...	55	. . . . .	55
Guerin, ...	55	. . . . .	55
	214	. . . . .	214

To these must be added the numerous experiments of Boeck, Cullerier, Taupin, and Heyman. Boeck experimented on a large number of cases, and he took great care to mix the blood of the vaccinifer with the vaccine lymph. Here we have a record of three hundred or more direct efforts to produce vaccinal syphilis, and every such effort was unsuccessful. It must be admitted that these experiments are a thousand-fold more valuable than the details of cases of alleged vaccinal syphilis, for they were conducted under intelligent supervision, and in accordance with conditions which were carefully observed. From these experiments the experimenters could and did know that the vaccinifers were syphilitic; that the lymph of a genuine vaccine vesicle was used; and if or not it was admixed with syphilitic blood or other inoculable matter. It should be remembered, in comparing these data, that the reports of cases of alleged vaccinal syphilis were wanting in every one of these essential

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points of observation: they were entirely accidental, and were not expected to occur. Dr. Viennois, of Lyons, made an exhaustive investigation of vaccinal syphilis, and as the result of his labors said,—"There is no infectious quality in the vaccine matter itself, and if we employ the vaccinal fluid only in inoculating a healthy child, the operation will be safe. If the vaccine matter taken from a syphilitic subject is without any admixture of blood, the result will be a vaccinal pustule only, without any syphilitic complications, either immediate or future." This, gentlemen, is the teaching of the profession of medicine in all countries at the present day. That some few persons have been infected with syphilis by persons attempting to vaccinate them, no one is ready to deny; but when such results followed, they were probably inoculations with syphilitic blood or virus, not vaccine virus. No physican, except for experiment, should ever vaccinate any person to serve as a vaccinifer, unless such person be in undoubtedly good health, and known to be free from scrofula, consumption, or syphilis. This proposition is reasonable, for it is wrong to risk unnecessarily any one's health.

Call the attention of vaccinophobists to the fact that vaccinal syphilis has been so rarely pointed out, and they will say the profession of medicine is a body of blind worshippers over the grave of Jenner, and has never tried to ascertain the truth of the matter. Let us see if this be true. In 1856, fifty-eight years after vaccination had been generally practised, the Board of Health of London issued a circular letter addressed to the various governments, asking information in relation to vaccination and its results. This board propounded the following searching question, among others: "Third. Have you any reason to believe, or suspect, that lymph from a true Jennerian vesicle has ever been a vehicle of syphilitic, scrofulous, or other constitutional infection to the vaccinated person, or that unintentional inoculation with some other disease, instead of the proposed vaccination, has occurred in the hands of a duly educated medical practitioner?"

The Imperial Society of Surgeons at Vienna, Austria, replied,—"Although it may be maintained that the blood of individuals affected with secondary syphilis can serve as a vehicle for this specific contagion, even this theory (if it could be proved) would not exercise any influence on the practice of vaccination; for both experiments made on purpose (Heim) and accidental vaccinations have taught that without considering the quality of the vaccine lymph, that taken from syphilitic subjects may have been used upon healthy persons, and the contrary, viz., from healthy individuals and used upon persons suffering from syphilis, without, on such occasions, the latter disease having been conveyed with the cow pox. What has here been proved in reference to syphilis may be applied equally to all other dyscrasic diseases, since this even, in cases of direct vaccination with their morbid products, has always shown a negative result."

The Faculty of Medicine at Prague replied,—"The experience obtained in this country gives no grounds which lead either to the belief or pre-

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sumption that the consequence to a vaccinated person can be such as put forth in this question."

The Imperial General Hospital of Vienna replied in like manner with the Faculty of Medicine at Prague.

The Imperial Lying-in and Foundling Hospital replied,—"A true vaccine pustule cannot become the vehicle for conveyance of syphilitic or any other contagion."

From Bavaria the following reply was given: "In Bavaria, up to the present time, two cases have happened of syphilis being inoculated with vaccinia. That was, however, in each of those cases, the fault of the vaccinating physicians themselves; and the accident could in either case easily have been avoided, since syphilis was unmistakably present in the children from whom the lymph was taken. The inoculation of syphilis can at all times be avoided by an observant surgeon who uses due circumspection in choosing the subject from whom he will take lymph for vaccination."

The answer from Denmark was as follows: "The experience which we have acquired in this country does not lead to the supposition that lymph taken from true vaccine can be the means of communicating any scrofulous or constitutional contagion."

The Duchies of Holstein and Lauenburg said,—"The experience which has been gained in the Duchies of Holstein and Lauenburg requires an answer to this question unconditionally in the negative."

The same question was propounded to every prominent physician and surgeon in Great Britain, including physicians and surgeons in charge of all the vast hospitals and public charities and vaccine stations, and no one of them failed to answer it in the negative.

Dr. John Simon, Chief Medical Officer of the Privy Council, examined thoroughly and exhaustively all the alleged cases of vaccinal syphilis, and, in his report for 1869, says but fourteen of all these alleged cases were to be attributed to vaccination, and every one of these fourteen cases were, he says, the result of malpractice on the part of the vaccinator. "If," says Simon, "our ordinary current vaccination propagates syphilis, where is the syphilis it propagates? Who sees it? The experience of this department is an entire blank upon the subject. For the last ten years we have been in incessant intimate communication with the different parts of England on details of public vaccination, and during these ten years every one of about 3,500 vaccination districts into which England is divided has been visited three or four times by an inspector specially charged with the duty of minutely investigating the local practice of vaccination; yet, from this systematic and extremely detailed search for all that has to be said on the subject of vaccination in England, no inspector has ever reported any local accusation or suspicion that a vaccinator had communicated syphilis."

Hutchinson's cases have since been reported.

In North Germany, so late as 1873, the testimony has been given that only two cases of alleged vaccinal syphilis have occurred during twelve

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millions of vaccinations made there up to that date. Syphilographers—those men who are most highly accomplished in the study of the causes and sources of syphilis—have almost unanimously declared that the alleged cases of vaccinal syphilis were but inoculations with syphilitic products, and such results will never follow vaccination, even from a syphilitic subject, if lymph from a genuine vaccine vesicle be used. Venereal specialists, such as Lancereaux, Cullerier, Ricord, Langston Parker, Acton, Lee, Bumstead, Hammond, and Keyes, never, in the whole course of their vast experiences, met with a single instance of vaccinal syphilis. But let it be admitted (in order that there may be some ground for the discussion) that every one of these cases of alleged vaccinal syphilis reported above was consequent upon vaccination duly and intelligently performed, even this would not detract one iota of the value of vaccination—the grandest discovery which has ever yet blessed man in his checkered career upon earth. Vaccination is capable of saving at least one million human lives every year; and if syphilis is actually proven to have occurred one time in a million vaccinations, is not all this fuss about vaccinal syphilis as a rational ground for abandoning vaccination the old story of the mountain in labor bringing forth a mouse?

To show the dangers of contracting syphilis which beset man at every turn in life, the following illustrations are furnished:

But we have recently heard intelligent physicians say that if one case of syphilis is proven to have followed vaccination, then vaccination must be abandoned. Gentlemen, this is serious ground; and if applied with the same rigor to the other branches of our profession the practice of surgery, of gynecology, of obstetrics, and dentistry must be abandoned. And if applied to man in all his surroundings with the same rigor, he must live on air, for syphilis has been frequently caused by the necessary processes of eating food and drinking water. Further than this: if a few cases of syphilis contracted in any manner are to doom all things from which they were contracted to be banished from use by man, then our race must be content with the covering of skin placed upon him as he sprang from the hands of his Maker, for syphilis has been caused repeatedly by infected clothing. Let us take the simple process of cupping, to forcibly illustrate this proposition. It is a well established fact that an epidemic of syphilis was produced at Brun, in Moravia, in 1577, by cuppings done by the bath man of the town. Suizer observed cases of the same nature at Bamberg in 1602; Horst, at Ulm in 1662; Wideman, at Windshelm in 1620—in the latter instance seventy cases of syphilis were caused by the simple process of cupping. Catheterism of the Eustachian tube is a very delicate yet harmless operation, and certainly syphilis is not a necessary consequence of its performance; yet a number of cases of syphilis from this source have been established—as many as thirteen such cases have been reported at one meeting of the Medical Society of Hospitals in France. The operations of circumcision, catheterism of the bladder, uterine examinations, accouchment, removal and transplanting of teeth, the lancing of a furuncle, have caused numbers of cases of syph-

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ilis, and if the rule sought to be applied to vaccination be invoked against these operations, then their performance is criminal. Even the forks and spoons and drinking-cups and tumblers have caused large numbers of cases of syphilis; and yet who is ready to abandon the use of these articles because some fellow with a syphilitic mucous patch in his mouth used them, and a careless and filthy butler placed them back upon the table without cleaning, and syphilitic infection followed? Again: it has been shown, upon as reliable testimony as vaccinal syphilis, that wearing apparel and bedding used by a syphilitic person, and afterwards used by a careless or filthy son of Adam, have caused syphilis; but we think the day is far distant ere this clothes-worshipping and bed-loving people will abandon these comforts because a few cases of syphilis have followed their use. These cases are all due to the same causes, *i. e.*, gross and inexcusable carelessness or filthiness.

That these cases have occurred is beyond question, and have produced ten times as many cases of syphilis as vaccination. The kiss of a lover has caused, by reason of mucous patches on the tongue, more syphilis than every one of the alleged cases of vaccinal syphilis. How often, Mr. President, do we meet with cases where, in consequence of ill health of the mother, or of insufficiency or total absence of flow of milk, a wet nurse is necessary to furnish food for the infant. There is scarcely a month but what the busy practitioner meets with such cases. Now, it is well known that syphilis has been caused in a vast number of infants by infection from syphilitic nurses. And yet because these unfortunate results are found, are we to forego the advantages of wet nursing, and thereby consign such children to the grave by resorting to cow's milk, or other more indigestible nourishment? Should we not display more prudence and judgment in selecting wet nurses? Again, how frequently have wet nurses been infected in nursing syphilitic children.

It must be admitted that in submitting to vaccination man incurs no greater risk of contracting syphilis than he does in submitting to the harmless minor operations of surgery or dentistry, or in the necessary process of eating food and drinking water in hotels, restaurants, railroad trains, hospitals, etc.

If vaccinal-syphilis is thought to be liable to be transmitted by humanized vaccine virus, than those fearing this result have in bovine virus a full protection against such an accident. But this remedy will not satisfy anti-vaccinists, for when Dr. Carpenter made this statement Mr. P. A. Taylor (their leader in England) replied,—

"I observe you add that 'tens' out of 16,000,000 would vanish under calf-vaccination. Of course you are perfectly aware that it is not yet a settled question whether what is called spontaneous cow-pox is (contrary to Jenner's opinion) protective against small-pox. Professor Simonds, Principal of the Royal Veterinary College, is (or was in 1879) distinctly of an opposite opinion. Speaking at the London conference on 'Animal Vaccination,' he used these remarkable words:

"'If this be so, you must fall back upon one of the old methods, and

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must inoculate your calf either with human small-pox, or with horse-pox. In the former case, you come under the statement of Sir Thomas Watson, that by the use of this lymph "there must have been a vast amount of mitigated small-pox spread about." If you fall back upon the horse, you will be liable, I suppose, to such horrible outbreaks as that of glanders, under which thirty-eight children are supposed to have suffered in Italy.'

"The following is from the *Lyon Medicale* of June 22, 1879:

"'On April 26th and 28th the local doctors vaccinated with this lymph (animal lymph) thirty-eight children, all aged less than twenty months. Whilst they were awaiting the incubation of the vaccine pustules, they soon perceived that they had inoculated one of the most horrible of maladies, and that they were the involuntary authors of a real massacre of the innocents. The gentleman who sent these particulars to the *Gazetta d'Italia* betook himself to San Quirico. He saw the victims. He observed vast phlegmons laying bare the muscles, and penetrating into the joints, accompanied by eclamptic symptoms. To him it appeared to be very probably an epidemic of glanders.'

"But even supposing you are able to inoculate with 'spontaneous cow-pox,' what is to secure against the transmission of bovine disease? I take the following from a letter sent by the guardians of Ashton-under-Lyne to the president of the local government board a few months since:

"On December 13, 1879, Mr. Simon wrote,—'When a given (animal) body is possessed by one of these constitutional diseases (scrofula, syphilis, etc.), no product of that body can be warranted safe not to convey the infection;' and Dr. Creighton, of Cambridge University, gives the history of twelve cases of bovine tuberculosis in human beings, the disease being a more rapid form of consumption than that peculiar to man."[1]

"As the new lymph will be obtained from bovine animals, in whom this tuberculosis is hereditary, and occurs in 4.75 per cent. of any given number of cows, the guardians are anxious to know if the local government board is prepared to take the responsibility of introducing another formidable disease (bovine tuberculosis) to man by means of the system of vaccination. * * * *"

"Some crazy enthusiasts recommend that lymph be taken direct from the cow. They cannot surely have seen those frightful pictures of the disease so produced, which were published by Mr. Ceely, of Aylesbury, some thirty years ago."[2]

After detailing the advantages of animal vaccination, Dr. Warlomont answers the objections of those who affirm that bovine tuberculosis and charbon may be transmitted by means of animal vaccination. It is admitted, in the first place, that tuberculosis may be inoculated. The experiments of ~~Villeium,~~ afterward established by Koch, demonstrate

[1] October number of *Journal of Anatomy and Physiology.*

[2] *Current Fallacies about Vaccination*, by P. A. Taylor, M. P., London, 1881.

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the possibility of transmitting tuberculosis by bacterial infection, the bacteria being also susceptible of cultivation apart from the body.

After detailing carefully the various experiments of Cohnheim and Baumgarten upon monkeys, rabbits, and Guinea pigs, including those in which tubercular tissue, as well as blood taken from freshly killed tuberculous animals, was inoculated into the eyes of rabbits, Dr. Warlomont sums up as follows:

"It is to be inferred from the preceding data that the bacillus of tubercle can transmit tuberculosis either by means of tubercle itself, or by tuberculous blood, or by air exhaled from an infected lung. * * * It would be puerile to overlook the importance of these data in their relations to vaccination, either animal or human. The security henceforth endangered must be no longer established upon theoretic grounds. It must be supported by experimental facts, which, fortunately, are not wanting. An extremely important fact is demonstrated by the experience acquired in the inoculation of tubercle, viz., *it is thus far found to be an impossibility to produce tubercular infection by the superficial insertion of bacilli.* In order to reproduce tubercle in an animal, it is necessary *to convey the bacilli into the depth of the tissues.* It is thus explained why no one is ever infected in making autopsies of tubercular subjects, and also *a fortiori* that no one has ever been infected with tuberculosis by the process of vaccination. * * * The absence, therefore, of a single fact establishing the possibility of producing tuberculosis by the superficial insertion of tubercle, as in the usual act of vaccination, assures us of the impossibility of such transmission, when the operation is performed with products having only remote relations to it."

In regard to the transmission of *charbon*, Dr. Warlomont says it is a rare disease among bovine animals, and also easily detected by experts. He also states that it is doubtful if a true vaccine vesicle could mature upon a victim of charbon, for the reason *that sick cattle will not develop typical vaccine vesicles.*

So much for syphilis: now for erysipelas. The most intelligent members of our profession have regarded erysipelas accompanying vaccination to be due generally to, first, lowered vitality or vitiated condition of the constitution of the vaccinee; second, to constitutional peculiarity of the subject, it being a well established fact that members of certain families have for generations contracted or developed erysipelas from the slightest surgical operation, or a trifling wound of the skin caused by the scratch of a pin; third, to what is known as an erysipelatous condition of the atmosphere, as when nearly all surgical operations, though widely separated, are complicated with erysipelas; fourth, to contagion from an existing case of erysipelas.

Before supervention of erysipelas can be properly urged as an objection to vaccination, the objector must, by reliable facts, establish that this disease follows vaccination more frequently than in minor surgical operations. "It is also a fact that a form of erysipelas, almost always slight,

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but always annoying, and sometimes fatal, has been observed, possibly, once in five hundred vaccinations, as generally done, and occasionally even after the most careful performance of the operation." Minor surgery will certainly show a like result under similar conditions,—*i. e.*, where operations are done among all classes and conditions of peoples, in any and all seasons of the year, and without any constitutional preparation, as is necessarily done in vaccination.

SCROFULA.

"According to the researches of Dr. Greenhow, previous to the introduction of vaccination, the death-rate from scrofulous diseases was five times greater than it is at the present time; and the present death-rate of pulmonary consumption, great as it is, is seven per cent. lower than it was previous to Jenner's discovery."[1]

Your committee frankly confesses that this reduction of mortality from phthisis pulmonalis is largely due to hygiene, which has been gradually operating to the benefit of those suffering from phthisis pulmonalis as well as those hereditarily predisposed thereto. The fact is only cited to show that if vaccination produced consumption, the disease would increase instead of decrease. The same may be partially true of scrofula.

EFFICACY OF VACCINATION.

Before attempting the demonstration of this proposition, let us determine what proportion of mankind unprotected by vaccination is liable to contract small-pox if brought in contact with this poison. The experience of centuries unquestionably demonstrates the fact that the human race, with the exception of the merest fraction thereof, will, in the course of a natural lifetime, contract small-pox if brought in contact with it. This proposition being admitted, let us appeal to the conclusive demonstrations of Jenner. After vaccinating six thousand persons, he inoculated nearly all of them with the virus of small-pox, and failed to develop the latter in a single instance. What test could be so fair or thorough?

The difficulty of demonstrating this proposition from the records of civil populations is apparent to all, for vaccination of an entire population has never been known in a community of civilians. Dr. Makena describes an epidemic of small-pox in the Argentine Confederation from 1846–'48, "as sweeping with the wings of death over that enormous tract of country which extends from the seaboard of the Atlantic on the east, to the Cordillera of the Andes on the west. Throughout this whole space it may be said that hardly a single house or ranche escaped its fearful visitation, wherever the current of human intercourse reached; and such was its fatality that I have known thirty children taken in one morning from the houses of one quadra of a street one hundred and fifty yards long. Whole families were swept away, and, in short, the ter-

[1] *Transactions American Medical Association*, 1865, page 269.

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rors of the plagues of former times were, if not surpassed, fully equalled by this horrible scourge. But that which struck me as most truly remarkable was, that not one of those English people who had been vaccinated at home, and who had the large, deep, oval thimble-mark on one or both arms, ever took the disease."

To go back to Jenner's day, we find the following testimony from his papers: "From 1762 to 1792 the number of persons that died of small-pox in the Danish dominions amounted to 9,728. About the year 1802 vaccination was first introduced, and the practice became general, but not universal; however, fifty-eight persons died of small-pox in the year 1810. Vaccination, by order of the king, was now universally adopted, and small-pox inoculation prohibited; and from the year 1810 to the year 1819 not a single case of small-pox has occurred. From Bombay, I learn the small-pox is there completely subdued, not a single case having occurred for the last two years."

Drs. Seaton and Buchanan, in 1863, examined more than fifty thousand children in the national schools and workhouses in England, to attempt to determine what proportion of them were unvaccinated, what proportion had formerly been vaccinated, and the number among those vaccinated who had contracted small-pox since vaccination.

Here is the tabulated results of that investigation:

are

Classification of children.	Number examined of each class.	Number in each class that had traces of small-pox.	Proportion having traces of small-pox per 1,000 children in each class respectively.
1. Without any mark of vaccination, ...	2,837	1,010	3.60
2. With doubtful mark of vaccination, ...	508	30	.59
3. With mark or marks of vaccination, ...	49,570	88	1.78

Lord Jeffrey, in 1807, at that time editor of *Edinburgh Review*, a man most thoroughly skilled in the principles of searching and rigorous applications of the rules of evidence, highly endorses the value of vaccination, and says of Jenner's claim,—"Not until he had vaccinated some hundred children, and put them at different intervals to the test of inoculation for small-pox without effect, that he ventured to publish his discovery, in the year 1798, in a treatise, followed up the year after by a still longer list of such experiments and observations." In the same article he adds,—"When the practice of vaccination was discussed and confidently recommended, in 1800, by all the eminent practitioners in London, this was done only after full consideration of its efficacy, as compared to inoculation for small-pox; that Dr. Woodville, in particu-

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lar, physician to the small-pox hospital, then stated that within the last six months he had vaccinated there 7,500 persons, the half of whom had been since inoculated with small-pox matter without the slightest effect being produced in any instance."

The report of the faculty of medicine at Prague to the minister of the interior, requesting information for the government of Great Britain relative to the results of vaccination, offers the most interesting tables of any known to us. From this vast store-house of facts the following summary is taken:

From 1796 to 1802, inclusive, the average annual population observed was	3,039,722
Total average number of deaths annually from all causes,	94,955
Total deaths annually from small-pox,	7,673

showing one death from small-pox to every 396 of the population, and the deaths from small-pox to the total number of deaths was 1 in 12½. From 1832 to 1855, inclusive, during twenty-four years subsequent to introduction of vaccination, with an average population of 4,248,155, the total deaths annually were, on an average, 131,412. The average number of deaths annually from small-pox was 287 7-24, showing deaths from small-pox to population to be 1 in 14,741; deaths from small-pox to total number of deaths, 1 in 457. Among an average annual population of 143,122 persons vaccinated, and 4,291 unvaccinated, the cases of small-pox annually existing were 389 among the vaccinated, and 355 among the unvaccinated population,—*i. e.*, one case of small-pox occurred among 367 vaccinated; one case of small-pox occurred among 12 unvaccinated. These tables further show the following facts: One fatal case of small-pox occurs among 7,166 vaccinated; one fatal case of small-pox occurs among 40 unvaccinated. In the Grand Duchy of Baden similar fruits have followed vaccination. Reliable statistics show that for a long number of years of compulsory vaccination, with an average annual population of 1,200,000, only 100 cases of small-pox occurred each year, and only thirteen of this vast population have died each year of small-pox.

In Great Britain, from 1750 to 1800, of every 1,000 deaths 96 were from small-pox; from 1800 to 1850, of every 1,000 deaths 35 were from small-pox. During the latter period the population was quite generally, but by no means universally, vaccinated.

In the German states, where more attention had been paid to vaccination, the following were the results obtained: Before vaccination of population, deaths from small-pox amounted to 66.5 per 1,000; subsequent to vaccination, 7.66 per 1,000.

Dr. Marson, of England, from the records of his great hospital experience, shows the merits of vaccination: "The small-pox death-risks of no-vaccination are to the death-risks of the very worst vaccination as three to one; to the death-risks of the best vaccination as seventy to one."

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In Norwich, England, in an epidemic of small-pox in 1819, Dr. Cross found that, in thirty-one families, those who had had cow-pox were living in the same room, or lying in the same bed with others suffering or dying from natural small-pox, yet remained perfectly safe, with the exception of only one child, whose mother reported that it had ten pustules.

From an experience of twenty-one years in Bohemia, among 4,000,000 of population, the testimony of that country most strikingly illustrates the value of vaccination. Among the vaccinated population contracting small-pox the death-rate was but 5.1 per cent.; the death-rate of the unvaccinated was 29.8 per cent.

The most reliable statistics, and at the same time the fairest, upon the value of vaccination, are to be found in the records of the army, for here alone is it possible to compel thorough vaccination of the entire population. Infringement of personal liberty, so dearly availed of as the shibboleth of the civilian, is treated with merited contempt in the army when it contravenes the rights of others. Vaccination having been decided an individual and collective benefit, the soldier has no choice in the matter: he is compelled to submit to it. In thus protecting himself, he at the same time benefits his comrades. To the honor of the surgeons of the army and navy be it said, they are able, fearless, and conscientious sanitarians, and in no other department have the rich results of sanitary science shown forth so conspicuously. Sir Gilbert Blaine says, prior to vaccination,—"Small-pox was one of the greatest embarrassments to the operations of armies." Let us see how it was after vaccination.

By reference to the statistics of sickness and mortality in the army of Great Britain for the twenty years from 1817 to 1836 inclusive, the following data are to be found (every soldier is vaccinated upon entering the army):

In the dragoon regiments and guards, with an aggregate of 44,611 men, with a total mortality of 637, but three deaths occurred from small-pox.

At Gibraltar, with an aggregate of 60,000 troops, with a total mortality of 1,291, only one death was caused from small-pox.

Among the British and white troops in the West Indies, with an aggregate strength of 86,000, and a total mortality of 6,803, and among the black troops, numbering 40,000, with a mortality of 1,645, not one fatal case of small-pox occurred, although during this period several epidemics of small-pox decimated the islands.

Among the troops at Bermuda, Nova Scotia, Cape of Good Hope, and Mauritius, for twenty years there was not one death from small-pox.

In Western Africa, while small-pox was ravaging the inhabitants unvaccinated, not a case of small-pox occurred among the white soldiers who had been vaccinated.

From 1818 to 1836, inclusive, in an army of 40,000 aggregate, British troops at Malta, while small-pox was playing sad havoc among the un-

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vaccinated inhabitants, in repeated epidemics, there were only two deaths from this disease in the vaccinated army.

During the same period in Ceylon, among the white soldiers, with a total mortality of 3,000, there were only four deaths, with eight cases, from small-pox, notwithstanding repeated epidemics of the disease among the natives.

In the British troops serving in the United Kingdom, from 1859 to 1864, inclusive, the following were the results of vaccination:

Total number troops,	473,483
" cases of small-pox,	664
" deaths from small-pox,	40

showing the ratio per 10,000 of strength to be,—

Cases of small-pox,	14
Deaths from small-pox,	0.84

In the British navy,—home force,—for the same period of time, 1859 to 1864, inclusive, the following data are furnished:

Total mean strength.	Cases of small-pox.	Deaths.	Ratio per 10,000 of strength.	
			Cases.	Deaths.
127,660	416	29	33	2.3

Since 1803 to 1863, among the thousands of vaccinated children admitted into the Royal Military Asylum of England, there has not been a case of fatal small-pox. This testimony is the more striking since the records show that during that time four deaths occurred among those who had previously had small-pox.

Similar data might be furnished to an almost unlimited extent, but the further elaboration of this point must be unnecessary.

In England alone, for nearly a century before the introduction of vaccination, no fewer than 30,000 persons were annually cut off by small-pox, which, in the same ratio, according to the present population, would be equivalent to 100,000 deaths annually. Out of every 1,000 deaths, from 1750 to 1800, there were by small-pox 96; from 1800 to 1850, there were, for the same number, but 35.

In Germany, for the same periods of time, there were, out of every 1,000 deaths for the former period by small-pox, 66.5; for the latter period, 7.26.

In Sweden, for the last twenty-eight years before the introduction of vaccination, out of each million of the population there were 2,050 deaths annually by small-pox; for forty years subsequent to the introduc-

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tion of vaccination, the number of deaths annually by small-pox, per million of inhabitants, was 158.

In Westphalia, from 1776 to 1780, the annual small-pox death-rate per million of inhabitants was 2,643; from 1816 to 1850, it was 114.

In Copenhagen, 1751 to 1800, the annual rate per million was 3,128; from 1800 to 1850, it was 286.

In Berlin, for the same periods, the rates relatively were 3,442 and 176.

American statistics, so far as known, are equally conclusive. According to a paper read by Dr. Robert Ware, before the Boston Sanitary Association, we learn that in Boston, in 1721, the year in which inoculation was introduced, and when the whole population was 11,000, 5,759, or more than one half, had small-pox, and of these 844 died. In 1730 there were 4,000 cases, and 200 deaths. In 1752, when the population was 15,684, there were 5,545 cases, and 539 deaths. In 1764 there were 5,646 cases; in 1776, 5,292; in 1792, 8,346. Compared with a subsequent period, after the general introduction of vaccination, and when it was in a measure compulsory, from 1815 to 1830, the mortality from small-pox was only 14: from 1811 to 1839 it was but 52.

By an approximate average death-rate by small-pox per million of living population, from 1750 to 1800, and from 1800 to 1850, in various countries (collected by the Epidemiological Society of London), there were, in the former period, nearly twenty times as many deaths by small-pox as there were in the latter.[1]

Mr. P. A. Seljestrom (a rabid anti-vaccinist), who the *Vaccination Enquirer* assures us "has mastered the vaccination question," says, in that journal November, 1882, page 130, of Swedish statistics of mortality from small-pox before and after vaccination:

Years before compulsion.	*Average annual small-pox mortality.*
1756–1775,	5,480
1776–1795,	4,617
1796–1815,	2,303
After compulsion.	
1816–1835,	450
1836–1855,	577
1856–1875,	1,031

[1] *Transactions American Medical Association*, 1865, pages 267, 268.

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APPROXIMATE AVERAGE ANNUAL DEATH-RATE BY SMALL-POX PER MILLION OF LIVING POPULATION.[1]

Countries in which records have been taken.	Terms of years, respecting which particulars are given.	Annual death per million by small-pox *before* introduction of vaccination.	Terms of years, respecting which particulars are given.	Annual death per million by small-pox *after* introduction of vaccination.
Austria, Lower,	1777–1806	2,484	1807–1850	340
Austria, Upper, and Salzburg,	1777–1806	1,421	1807–1850	501
Styria,	1777–1806	1,052	1807–1850	446
Illyria,	1777–1806	518	1807–1850	244
Trieste,	1777–1806	14,046	1807–1850	182
Tyrol and Voralberge,	1777–1803	911	1807–1850	170
Bohemia,	1777–1806	2,174	1807–1850	215
Moravia,	1777–1806	5,402	1806–1850	255
Silesia (Austria),	1777–1806	5,812	1807–1850	198
Gallicia,	1777–1806	1,194	1807–1850	676
Bukswina,	1777–1806	3,527	1807–1850	516
Prussia, East Province,	1776–1780	3,321	1810–1850	556
Prussia, West Province,	1876–1780	2,272	1810–1850	356
Posen,	. . –1780	1,911	1816–1850	743
Brandenburg,	1776–1780	2,181	1810–1850	181
Westphalia,	1776–1780	2,643	1816–1850	114
Rhenish Provinces,	1776–1780	908	1816–1850	90
Berlin,	1781–1805	3,422	1810–1850	876
Saxony (Prussia),	1776–1780	710	1816–1850	170
Pomerania,	. . –1780	1,774	1810–1850	130
Sweden,	1774–1801	2,050	1810–1850	158
Copenhagen,	1751–1800	3,128	1801–1850	286
		62,861		7,403
		7,403		
Lives saved,		55,458		

"We thus find that out of 22,000,000 of people there died annually from small-pox, previous to vaccination, 62,861, and from the same num-

[1] *Small-pox in New York City*, with some statistics and remarks on Vaccination, by Wm. H. Richardson, M. D., of Westport, N. Y., being a report of the Committee on Public Health, of the New York legislature, submitted February 10, 1865.

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ber of people there have died annually, since vaccination was adopted, only 7,403, thus saving annually the lives of 55,458 persons, besides the relief from physical suffering, which those who are afflicted with this terrible scourge must necessarily endure.

"From all the evidence we have been able to obtain, we have reason to believe,—in fact, we are almost positively certain,—that had the vaccination been perfect and universal among these 22,000,000, the other 7,403 could have been saved also. In proof of this view of the case, I append the following statistics, which have been furnished me by Dr. Whittelsey, the resident physician of Randall's Island:

"It will be observed that in the nursery hospital, during the years of 1854–'55–'56, there were admitted 3,566 children, and yet no case of small-pox occurred during this period, except the four cases that were brought there suffering from the disease at the time of admission, and it never spread to the other inmates in a single instance.

"During these three years the doctor attended personally to the vaccination of every child on admission, but in the subsequent five years he states that it was done by subordinates, and in many instances overlooked entirely, and the result is clearly seen in the tables following, which show that forty-four cases of small-pox had occurred out of 6,867 children admitted during these five years.

"But in the Refuge Hospital, which he retained under his own personal supervision, and in which he has persistently continued the plan of vaccination on admission, he has *entirely exterminated the disease for the last seven years.* These statistics speak volumes, and prove conclusively that the disease can be exterminated by *universal* and *efficient vaccination* and revaccination, and I beg therefore to call your especial attention to them.

NURSERY HOSPITAL STATISTICS OF SMALL-POX.

Date.	Number inmates.	Number admitted.	Whole number.	Cases small-pox.	Elsewhere contracted.	Remarks.
1851, . .	1,354	2,087	3,441	4	. . .	
1852, . .	1,419	1,794	3,213	1	1	
1853, . .	1,311	1,729	3,040	7	. . .	
1854, . .	1,305	1,385	2,690	3	3	First year of vaccination on admission.
1855, . .	1,156	1,222	2,378	1	1	
1856, . .	1,062	959	2,021	. . .	. . .	No cases contracted in the institution since commenced to vaccinate on arrival.
1857, . .	879	1,276	2,155	4	. . .	
1858, . .	1,407	1,169	2,576	13	8	

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NURSERY HOSPITAL STATISTICS OF SMALL-POX—*continued.*

1859, . .	1,320	1,148	2,468	11	3	
1860, . .	1,142	1,397	2,539	6	3	
1861, . .	1,153	1,877	3,030	10	5	
	13,508	16,043	29,551	60	24	36 whole number contracted in the institution.
		13,508				
		29,551				

Whole number of inmates during a period of eleven years, ...	29,551
Whole number of cases of small-pox during that period, ...	60
Of which there were contracted and brought to the institution, ...	24
Average yearly number of inmates, ...	2,686
Average yearly cases of small-pox, ...	5¼
Contracted elsewhere, ...	2½

HOUSE OF REFUGE STATISTICS, BY DR. WHITTELSEY.

Since 1855 all children, deemed unprotected, have been vaccinated on their arrival.

There were in the Refuge January 1, 1855, ...	419	children.
There have been admitted up to January 1, 1862, ...	2,021	"
Total number, ...	2,440	children.

During this period of seven years no case of small-pox or varioloid has occurred in the Refuge, notwithstanding there were children admitted, during the time, suffering with the disease, necessarily exposing the inmates to contagion.

It must be admitted that vaccination does not (and never did) confer absolute immunity from small-pox to all persons. It is well known that the College of Surgeons in 1806, by a circular letter sent to every one of its members, requested to be informed of their experience as to the protective influence of vaccination. From the replies received the College of Surgeons communicated to the College of Physicians the following information:

"To such letters the Board [Board of Curators] have received 426 answers, and the following are the results of their investigation:

"The number of persons stated in such letters to have been vaccinated is 164,381.

"The number of cases in which small-pox had followed vaccination is 56.

"The Board thinks it proper to remark, under this head, that in the enumeration of cases in which small-pox has succeeded vaccination, they have included none but those in which the subject was vaccinated by the surgeon reporting the facts."

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Within the next third of a century post vaccinal small-pox was constantly increasing, and, in some instances, alarmingly so. Indeed, it were too much to hope or believe that vaccination should confer absolute immunity to every person against an attack of small-pox. Small-pox itself occasionally fails to protect the subject against a second attack thereof. The same is true of scarlatina, measles, whooping-cough, yellow fever, etc. In the vast majority of instances one attack of either of the above-named diseases confers immunity against a second. But the exceptions to the rule are numerous and well attested.

In the signal victory secured for vaccination, the triumph succeeding the scorn and bitter denunciation of the measure and its author, too much was expected of this grand discovery. It was first claimed that vaccination secured absolute immunity against an attack of small-pox. The protection being tested upon an extended number of persons and in lengthened periods of time, the claim was modified, and it was then asserted that a vaccination, duly and efficiently performed, secured the subject against an attack of small-pox as much as one attack of small-pox protected against another.

The failures of vaccination, small in number comparatively though they were, even at that early date, were seized upon, and as at the present time, magnified a thousand fold. This cast a damper upon the cause of vaccination, and some persons doubted the protective power of the measure. As Simon says,—"There seemed to be a breach in the contract under which vaccination had been accepted. In what had promised so much, failures were all the more conspicuous; men looked to them, even where most exceptionable, rather than to the successes of vaccination, and there were (1820–'35) not a few persons whose minds began to misgive them whether the old plan of small-pox inoculation had not perhaps been too easily abandoned."

The continued occurrence of post vaccinal small-pox led to serious and careful investigation, and it became apparent that after a lapse of time a vaccination performed in infancy in a majority of cases failed to fully protect the subject when adolescency was attained, and, therefore, that revaccination should be practised about that time. Revaccination being practised, the result in protecting the subject so operated upon was marvellously demonstrated.

It is confidently claimed, and we believe demonstrated in accompanying statistics, that, whatever weakness attaches to the protective power of vaccination, it has reduced the mortality of small-pox to a tenth or twentieth of its former proportions.

REVACCINATION.

Revaccination at puberty being admitted as necessary to give the recipient the full protective benefit of vaccination, let us examine the record and see what this protective power has been demonstrated to be. Dr. Seaton (in report of Medical Officer of Privy Council and Local

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Government Board for 1874) says,—"The observations which were made during the recent epidemic [1870–1873] afforded remarkable evidence of the value of revaccination, not merely in controlling the mortality from small-pox, but usually preventing altogether the occurrence of the disease. Its power of preventing small-pox under circumstances the most favorable of all others for contracting it was tested on a very large scale on the nurses, servants, and attendants of the various hospitals established for the treatment of the epidemic in the metropolis and in the provinces, the attendants in the hospitals of the Metropolitan Asylum Districts alone amounting at one time to above three hundred. In every hospital report which has reached me it is specially stated that not a single one of these officials, who had been revaccinated before coming to take duty at the hospital, contracted small-pox. On the other hand, a few cases occurred among some nurses and servants in the hospitals of the Metropolitan Asylum District whose revaccination in the pressure of the epidemic had been overlooked; and there was one case in a nurse who, having had small-pox previously, had consequently not been vaccinated on coming into the hospital. There was also a very modified case in a nurse in whom revaccination had been performed, but not till after her arrival at the hospital, and when the small-pox infection had already been received. The cases of small-pox which were admitted for treatment in the several hospitals in persons who had been successfully revaccinated were very few and very slight. In the hospitals of the Metropolitan Asylum Board, in which upwards of 14,800 cases of small-pox were treated, there were but four cases in which there was good evidence of revaccination having been performed with effect, and these were all light cases. In Liverpool, says Dr. French, revaccination was found a constant and perfect protection against small-pox. In the Newcastle-on-Tyne small-pox hospital, in which 778 cases were treated, there were two in which revaccination was alleged to have been successfully performed, one of them ten years and the other four years before the attack of small-pox: both of them recovered. In the same hospital eight patients were admitted stated to have had small-pox, five of whom were distinctly marked by it: one of the three not marked died, the remaining seven all recovered. In the Leeds hospital there were four cases in which previous revaccination was alleged, but in none of them was the evidence of revaccination conclusive. One of them, in which the revaccination was said to have been done at seven years of age, was fatal: the other three cases were mild. There were three (fatal) cases of small-pox in persons believed to have had small-pox previously, but the evidence of the former small-pox is not stated. Similar infrequency and mildness of small-pox after revaccination was noted in the hospitals abroad. In the Municipal small-pox hospital at Berlin, in which 1,529 cases were treated who had been vaccinated, only nineteen of these were in persons (all above thirty years old) who had been successfully revaccinated; they were all of them cases of varioloid, or of variolous fever without eruption, and none of them died. In the same hospital there were seven

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cases (three of them fatal) in persons who had previously had small-pox.[1] In the Baracken-Lazareth, used also as small-pox hospitals in the same city, in which 1805 cases were treated in persons who had been vaccinated, seven only were in persons who had been successfully revaccinated, of whom six had a mild atttack, and one (a woman 60–70 years old) had the hemorrhagic form and died.[2] In the hospital at Leipsic, out of 1,504 vaccinated patients there were thirteen who had been successfully revaccinated in early life, all of whom recovered; in the same hospital there were twenty-two cases in persons who had had previous small-pox, and of these six died.[3] In the hospital at Hamburgh the cases in persons who had been revaccinated were more numerous, amounting to fifty-nine out of a total of 2,267 vaccinated patients, and there were three deaths.[4]

Dr. Marson, having the greatest experience perhaps of all writers upon this subject, says of the test of vaccination in preventing small-pox,—"For thirty years we have revaccinated all the nurses and servants who had not had small-pox, on their coming to live at the small-pox hospital, and not one of them has contracted small-pox during their stay here."

In Wurtemberg with a vaccinated population of 1,263,298, during five years the total number of cases of small-pox was 1,677,—354 of these were cases of confluent small-pox, 1,043 were cases of varioloid,—being about one case of failure of protection against small-pox to 217 vaccinated persons. In a few years subsequently, of 44,000 revaccinated subjects, 20,000 took the vaccine disease perfectly, 9,000 imperfectly, and failed with 15,000, the successful revaccinations being almost exclusively in those who had been vaccinated many years previously.

Of 14,334 revaccinations in the army of Wurtemburg, 8,845 had what are described as genuine vaccine marks or scars, and of this number 31 per cent. were successfully revaccinated; aborted vaccine vesicles in 29 per cent.; and revaccination failed in 40 per cent. With those having imperfect marks of previous vaccination, revaccination succeeded in 28 per cent., modified in 26 per cent., failures 46 per cent. Mr. Simon, in his able digest of the subject, published by the General Board of Health, shows that, during the years from 1833 to 1837, notwithstanding the fact that small-pox had been sixteen times brought into the army of Wurtemburg, there had ensued among the 14,334 revaccinated soldiers one single instance of unmodified small-pox.

In the Prussian army, in 1840, revaccination was performed upon 43,522 soldiers. Upon these soldiers were found distinct vaccine cicatrices in 34,573; indistinct vaccine scars in 6,177; in 2,772 persons no scars of previous vaccination were found, although they had formerly been vaccinated. The result showed 20,952 successful revaccinations; 8,820 partially successful; and 13,750 unsuccessful revaccinations. Re-

[1] Report by Dr. Lottier Mayer, *Deutsche Klinik*, 1872, pp. 262 and 263.
[2] Report by Dr. Guttstadt, *ibid*, p. 357.
[3] Report by Dr. Wunderlich, *Archiv der Heilkunde*, 1872, p. 97.
[4] Report by Dr. Oppert, *Deutsche Klinik*, 1872, p. 72.

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vaccination was practised in this army because of the increase of the number of cases of post-vaccinal small-pox among the soldiers. For ten years prior to 1831 these cases had been observed; and from 1831 to 1833, 312 deaths had occurred among the troops formerly vaccinated. For twenty years subsequent to revaccination, two deaths annually have occurred from small-pox, whereas 104 deaths annually occurred before revaccination was practised.

In the Bavarian army revaccination has been compulsory since 1843; and for twelve years,—1843 to 1855, as shown by the report of the minister of war,—not a case of unmodified small-pox had occurred. A few cases of varioloid had occurred during this period of time, but not a single death from small-pox.

In the Russian soldiers at Kazan, the army being revaccinated, 18 per cent. of perfectly successful revaccinations were obtained.

From the army of Denmark during the years 1842–'47, 20,000 soldiers were revaccinated, nearly fifty per cent. of revaccinations being successful.

The armies of Sweden and of Baden, and the British army, offer incontrovertible testimony of the necessity of revaccination, and almost total exemption of the revaccinated from small-pox. It would be both interesting and instructive to give these details did the limits of this paper permit. But one more demonstration of the value of revaccination. From the report of the faculty of medicine of Prague, the following facts are shown: From 1840 to 1855 inclusive, the average number of revaccinations annually were 11,617 2-16. Average annual successful revaccinations, 4,506; unsuccessful, 6,890; unknown, 213. From this it appears that of every 100 revaccinations there were 38 3-5 successful, 59 2-5 unsuccessful, and 1 4-5 unknown.

HOSPITAL EXPERIENCE.

[1]*Manchester Royal Infirmary*—Dr. Henry Thomkins, medical superintendent of the fever hospital belonging to the Manchester Royal Infirmary at Monsall, in a paper recently read at Owens college, said,—"The most striking of all evidence is, perhaps, that derived from the small-pox hospitals themselves. Here the protective influence of vaccination is seen and proved in a manner beyond all cavil. At Highgate, during an experience of forty years, no nurse nor servant, having been revaccinated, has ever contracted small-pox; and evidence of the same character I can myself bring forward, for, during the whole time that I have had charge of the fever hospital, more than a thousand cases of small-pox have passed under my care; yet no servant, nurse, porter, or other person engaged there has, after revaccination, ever taken it, though exposed daily to infection in its most concentrated form. * * Again: among all the students who during the past two years have attended the hospital for clinical instruction, not one has suffered, all having been

[1]First annual report of the Board of Health of Detroit, Mich., pages 109 and 110.

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revaccinated before being permitted to enter the small-pox wards. * * I defy the most enthusiastic or conscientious of anti-vaccinators to produce evidence like this on his side of the question, or to bring forward even half-a-dozen persons, choose them whence he may, who have not been protected against small-pox, and expose them as the students are exposed, without more or less of the number taking the disease."

"Dr. de Kerschensteiner, chief medical officer of Bavaria, as the result of official statistics of Bavaria for ten years, 1871–'80, says,—"Of those once vaccinated, 12 per cent. of those attacked, of the revaccinated only 7½ per cent., but of the unvaccinated, 46½ per cent. died of small-pox."

One of the finest records, showing the marvellously protective power of revaccination, was in the Franco-German war. Every soldier is vaccinated on entering the German army; and if the soldier has been vaccinated prior to entering the service, he is revaccinated. Little or no attention was paid to vaccination in the army of France. Now for the results in each army:

	[1]*Number of soldiers.*	*Deaths from small-pox.*
German army, ...	1,125,000	250
French army, ...	442,000	23,000

What does the ratio of epidemics teach us? Read it. The report of the Epidemiological Society of London says,—first, during ninety-one years, previous to inoculation, there were sixty-five distinct and well marked epidemics, which is a ratio of 71.4 epidemics in one hundred years; second, during sixty-three years in which inoculation was practised, and that to a great extent, there were fifty-three distinct and well marked epidemics, which is a ratio of eighty-four epidemics in one hundred years; third, during the last fifty years, in which vaccination has been practised and inoculation declared illegal, there have been twelve epidemics of small-pox, which is a ratio of twenty-four epidemics in one hundred years.[2]

With all this testimony before us (and we are prepared to submit thousands of pages additional if called for), we say, with Dr. O. W. Wight, the learned and renowned health officer of Detroit, Mich., "Yet there are men, apparently rational, who denounce vaccination, without suspecting that they are making themselves public malefactors."

REDUCTION OF GENERAL MORTALITY.

"Drs. Greenhow and Farr, under the auspices of the General Board of Health of London, have shown, that, with the decline of small-pox consequent on vaccination, the general death-rate has greatly diminished from all causes, and that, too, notwithstanding a severe and fatal epidemic of influenza and two epidemics of cholera; and under this diminution it is

[1]The strength of these armies is taken from *History of Franco-German War*, by Carl Winterfeld, 1871.

[2] See *Transactions American Medical Association*, 1865, page 268.

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especially notable that the two classes of disease usually considered the most fatal,—namely, scrofulous and low febrile affections,—have diminished in a remarkable degree. The general death-rate per 10,000 of living population, during the periods of 1846–'55, was 25 per cent. less than the decennial period of 1746–'55, and 40 per cent. less than the decennial period of 1681–'90, showing a successive decline since the remoter period from 421 to 355, and since the more recent period from 355 to 249.

"According to Dr. Farr's statistics, the average annual death-rates in London, from all causes and all ages, per 10,000 living, were,—

From 1771–1780,	500
" 1801–1810,	292
" 1831–1835 (small-pox prevailed),	320
" 1840–1854,	$248\frac{9}{10}$

"The average annual death-rates in Sweden, from all causes and all ages, per 10,000 living, were,—

From 1776 to 1795,	268
" 1821 to 1840,	233
" 1841 to 1850,	205

"In McColloch's Descriptive and Statistical Account of the British Empire, Dr. Farr has shown that fever has progressively subsided since 1771 (at first under the influence of inoculation), 'and that the combined mortality of small-pox, measles, and scarlatina is now only half as great as the mortality formerly occasioned by small-pox alone.'

"According to the researches of Dr. Greenhow, previous to the introduction of vaccination, the death-rate from scrofulous diseases was five times greater than it is at the present time, and the present death-rate of pulmonary consumption, great as it is, is 7 per cent. lower than it was previous to Jenner's discovery."[1]

But let us appeal to vaccinophobists for a preventive of small-pox, and they will say,—"We believe in sanitation. Let the people have an abundance of pure air, water, and food, and small-pox will not appear." Now, what does the whole science of medicine testify as to the etiology of small-pox? Here it is in a nut-shell: Small-pox spreads at the present time exclusively by means of a specific virus which is begotten in the body of a small-pox patient, and is conveyed directly by exposure of the person to one sick of small-pox, or coming in contact with infected clothing, bedding, etc. How absurd, then, is the claim for sanitation, for you can take an unvaccinated person to the purest air of the country, even upon mountain tops, and put him in contact with the virus of small-pox, and he will contract the disease as readily as if directly exposed to it in the filthiest slums of the filthiest population on earth. The same is true of water and food, whatever their purity. But put your unvaccinated subject

[1] *Transactions American Medical Association*, 1865, page 269.

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into a house where all the decaying garbage of a city, both animal and vegetable, is piled high as the second-story window, then pour water all through it, and call upon the heat of the sun to set all this putrefying mass into the most active putrefactive fermentation, and if small-pox virus has been kept away from it, your subject will die of typhoid fever or plague, but never of small-pox.

In conclusion, your committee begs leave to be permitted to quote (and fully endorse) the following language of the illustrious John Simon on the subject:

"It can be no common certainty which commands so general an assent. It can have been neither a truthless nor a barren doctrine, which, within sixty years from its rise, has all but universally satisfied private judgment, and has converted nations to its grateful followers.

"No truth can be thought of, against which some one does not rail, and it would be idle to hope, under existing conditions of the human mind, that vaccination should be much more generally credited than it is.

"Perhaps in no age of the world have persons, in proportion to their instruction, been readier than now to accept physical marvels, and to modify their conceptions of natural laws, at the biddings of quacks and conjurers. It goes with this credulity to be incredulous of proved truth. Alike in respecting what is known, and believing what is preposterous, the rights of private foolishness assert themselves. It is but the same impotence of judgment, which shrinks from embracing what is real, and lavishes itself upon clouds of fiction.

"To some extent, therefore, it may be felt a weary and unprofitable work to have spent time and labor in reasserting proofs which, fifty years ago, were exhaustive of the subject. * * * *

"They have enabled you to estimate the full measure of gratitude which is due to the discoverer of vaccination. They have set before you, as experience, what it must have seemed mere enthusiasm to foretell. You will read it in the skilled evidence of individuals, who, solely with the resources of Jenner's antidote, are maintaining day by day against the most dreadful of infections the victory which he commenced. You will read it in the colossal statistics of nations, which till sixty [now eighty-six] years ago were decimated by that one messenger of death.

"If utility to human life be any test of what is noble in labor, if our teachers of inductive philosophy have rightly advised us, *non tantum et ordini, verum, etiam usui et commodis hominum consulere*,—then assuredly the discovery, of which those things are told, may rank with any achievement of man.

"'Let men rejoice that there has shone so great a splendor from amid their race,' is the bidding which at Newton's tomb reminds us of immortal debts to the greatest interpreter of nature, and claims kindred for us with the power of his intellect, passionless and 'almost divine.' If corresponding honor be due to the most beneficent application of science,

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if our mortal state owes love to those who lessen its weakness and misery, surely here has been a second student of nature, who, also matchless in his career, might have claimed to lie beside that monarch of the intellect in his last repose, and to share the inadequate homage of that grateful epitaph.

"For, though a different, it is an equal praise, which the members of Jenner's profession vindicate for his honored name. He, too, could interpret nature, but, above all, he could render her teaching fruitful. To arm mankind against the worst of pestilences, to widen by one discovery the horizon of human life, to banish a cruel terror from every mother's heart,—such was Jenner's aspiration in his study of nature, such has been the fruit of his philosophy."

All of which is respectfully submitted.

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